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Qualitative Descriptive Study of Mexican Americans Health-Seeking Experience During Myocardial Infarction

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Qualitative Descriptive Study of Mexican Americans Health-Seeking Experience During Myocardial Infarction

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Dedication

To my husband Jonathan for his encouragement and patience as I toiled away on one task or another for school and work.
To Nikolaus for plenty of writing breaks full of play and diversions that recharged me at times.
To my mother, Kathy Crye, for giving me breaks from play and diversions for the last year, so I could get down to writing.
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Qualitative Descriptive Study of Mexican Americans Health-Seeking Experience During Myocardial Infarction

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Premature death due to cardiovascular disease, including myocardial infarction, is higher in Hispanics (23.5%) than non-Hispanic White (16.5%) adults. Delaying treatment over 60 minutes increases the risk of sudden death by 50%. The purpose of this study was to describe the perceived benefits and barriers to seeking cardiac emergency care including emergency medical services (EMS) activation during an acute myocardial infarction (MI) in Mexican American adults.

A qualitative descriptive design was used wherein semi-structured interviews and sociodemographic questionnaire were conducted with 12 Mexican Americans who had experienced an MI in the last two years. Qualitative conventional content analysis was used to uncover unique perceptions of Mexican Americans seeking emergency care.

The overall theme that arose was degree of perceived threat leads to action. This theme was comprised five categories: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and learned behavior. Perceived severity was closely intertwined with perceived susceptibility. Recent appointments with HCPs facilitated low perceived susceptibility to an MI and acted as a barrier leading to

decreased initiation of emergency services for MI. Participants attempted self-treatment and evaluation which was a barrier to immediate emergency care. Perceived benefits to initiation of emergency care were using EMS to achieve rapid treatment of MI symptoms. Though several participants initially stated they would activate EMS, further inquiry revealed calling EMS was considered a last resort if the participant were alone.

The findings suggest education of lay people and HCPs needs to emphasize that MIs can present in a variety of ways from slow-onset to fast-onset. A goal for nursing practice is to include regular screening on cardiac risk factors along with interventions and evaluation among patients and family. Future research should aim at finding the most successful format to provide public education to Mexican Americans on MI symptom and rapid initiation of EMS.

Table of Contents

List of Tables xiv

List of Figures xv

Chapter 1: Introduction 1

Background and Significance 1

Purpose 6

Aim 7

Research Question 7

Model 7

Definition of Terms 10

Assumptions 17

Limitations 17

Summary 17

Chapter 2: Review of Literature 19

Influencing factors 19

Acculturation Level 20

Age 23

Gender 26

Socioeconomic Status (SES) and Education 29

Health Care Access 33

Previous Health Encounters 37

Individual Beliefs 43

Perceived Susceptibility to Illness and

Perceived Severity of Illness 43

Perceived Barriers 48

Perceived Benefits 57

Self-Efficacy 59

Individual Behaviors: Learning, Action, and Cues to Action 61

Summary 63

Chapter 3: Methods....66
Design....66
Sampling....67
Study Population....67
Sample Size....70
Procedures....70
Recruitment....70
Data Collection....73
Instruments....75
Demographic data sheet....75
Data Analysis....76
Trustworthiness....78
Protection of Human Sujects....79
Risk to Subjects....79
Sources of Data....80
Potential Risks....81
Potential Benefits of the Study....81
Summary....83
Chapter 4: Results....84
Demographics of the Sample....85
Themes: Overview Subcategories, Categories, Overall Theme....88
Category: Perceived Susceptibility....89
Heart health....90
Pro-heart health....90
Con-heart health....96
Risk factors....98
Low perceived risk....98
High perceived risk (modifiable factors)....99
All in the family....102
MI symptoms....103

Actual symptoms and expected symptoms 105
Symptom congruence.....107
Category: Perceived Severity.....109
Category: Perceived Barriers 115
My way 115
Heath care provider barriers.....119
Health care access: Transportation and insurance 125
Inappropriate action/self-efficacy 129
Clock ticking.....134
Other people around.....135
Category: Perceived Benefits.....138
Category: Learned Behavior 141
Summary 148
Chapter 5: Summary, Conclusions, and Recommendations 150
Discussion of Categories.....151
Category: Perceived Susceptibility 151
Heart health.....151
Pro-heart health.....152
Con-heart health.....154
Risk factors 155
All in the family 158
MI symptoms 160
Category: Perceived Severity.....164
Category: Perceived Barriers 168
My way 169
HCP barriers.....171
Health care access: Transportation and insurance 173
Inappropriate action/self-efficacy 176
Clock ticking.....179
Other people around.....179

Category: Perceived Benefits....182
Category: Learned Behavior....183
Key Findings....186
Limitations of the Study....187
Implications and Recommendations....189
Nursing Theory....189
Influencing factors....191
Individual beliefs....191
Individual behaviors....192
Nursing Research....193
Nursing Practice....195
Health Policy....198
Conclusion Summary....199
Appendix A: Letters of Support....200
Appendix B: FAQ Flyer for Providers....202
Appendix C: Recruitment Flyer....204
Appendix D: Interview Questions....205
Appendix E: Demographic Data....206
Appendix F: Unanticipated Problem....208
Appendix G: Copyright Permission....209
References....211

List of Tables

Table 1: Major Concepts and Definitions of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction 11

Table 2: Sample Demographics 86

Table 3: Degree of Perceived Threat Leads to Action: Categories.....89

List of Figures

Figure 1: Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction 8

Figure 2: Perceived Susceptibility Exploded: Inclusion of Subcategories and Meaning Unit Clusters 92

Figure 3: Perceived Barriers Exploded with Subcategories 116

Figure 4: Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction---Revised 190

Chapter 1: Introduction

The purpose of this chapter is to introduce the significance of exploring and understanding the perceived barriers and benefits of Mexican Americans regarding the initiation of emergency health care during a myocardial infarction (MI). This chapter will cover the background and significance, purpose, aims, research questions, model, definition of terms, assumptions, and limitations of this study.

Background and Significance

Cardiovascular disease (CVD) is the leading cause (34.3%) of death across the United States (U.S.) (American Heart Association [AHA], 2005; Lloyd-Jones et al., 2010). The direct and indirect costs of CVD in the U.S. total over $286 billion (Lloyd-Jones et al., 2010). Coronary heart disease (CHD) results in 587,000 deaths annually, with MI the source of 181,000 of CHD deaths (Lloyd-Jones et al., 2010). This year across the U.S., 635,000 new MIs, 280,000 recurrent MIs, and 150,000 silent MIs are predicted to occur (Go et al., 2013). Approximately 15% of individuals experiencing an MI each year will die from the event (Go et al., 2013).

The benefits of immediate emergency medical services (EMS) activation include rapid assessment, treatment initiation, decreased time to thrombolytics, and interventions in the event of lethal cardiac arrhythmias which are most likely to occur in the first four hours after symptom onset (AHA, 2005; O'Connor et al., 2010). Patients arriving to the hospital within 12 hours of symptom onset may be reperfusion therapy candidates, reducing mortality by as much as 47% (O'Connor et al., 2010). Delays in emergency

treatment in MI may lead to debilitating heart disease, decreased quality of life, and death. Estimates state 16.6 years of life are lost due to each MI, and those that have had an MI are 4 to 6 times as likely to die suddenly compared to the general population (Go, et al., 2013; Roger et al., 2011; Thom et al., 2006). Individuals with ST segment elevation MI have a 1-year mortality risk increase by 7.5% for every 30-minute delay in treatment (De Luca, Suryapranata, Ottervanger, & Antman, 2004).

Hospitals have the technology to save lives and cardiac function in victims suffering MI (De Luca et al., 2004; Greenlund et al., 2004; Lloyd-Jones et al., 2010; McGruder et al., 2008). However, health care professionals are unable to save lives if the patients do not come to the hospital. In fact, acute MI treatment times more than one hour result in a 50% increase in the risk for sudden death, frequently due to lethal arrhythmias (AHA, 2005; O'Connor et al., 2010; Rosamond et al., 2008). Unfortunately, there has been no decrease in MI treatment-seeking times. From 1987 to 2000, MI treatment-seeking time was four hours or longer in nearly 50% of cases (McGinn et al., 2005; Riegel et al., 2007; Saczynski et al., 2008). A retrospective nationwide study examining acute coronary syndrome among hospitalized patients (n = 3,936 Hispanics, n = 90,280 non-Hispanic Whites) found Hispanics sought medical care 15 minutes later than non-Hispanic Whites and received cardiac catheterization three hours later (Cohen et al., 2006).

MI symptom awareness and cardiovascular health disparities remain pervasive issues with ischemic heart disease inversely related to income, poverty status, and

education (Barr, 2008; Clark, DesMeules, Luo, Duncan, & Wielgosz, 2009; Galea et al., 2007; Mensah, Mokdad, Ford, Greenlund, & Croft, 2005). Decision-making, which often results in pre-hospital delay, is influenced by: symptom awareness, recognition of the gravity and severity of symptoms, and the decision to activate EMS (Gärtner, Walz, Bauernschmitt, & Ladwig, 2008). Often the longest period of potential delay to treatment is the pre-hospital time from symptom onset and symptom recognition to activation of EMS (O'Connor et al., 2010). U.S. racial and ethnic discrepancies in MI symptom awareness contribute to significant delays in treatment-seeking behaviors among different races and ethnic groups (Centers for Disease Control and Prevention [CDC], 2008). As reported in the *Healthy People 2010* database only 30% to 49% of people knew MI symptoms and the importance of EMS activation (CDC, 2008). Asians (30%) and Hispanics (32%) were the least knowledgeable about MI symptoms and EMS activation (CDC, 2008).

The American Heart Association does not consistently report mortality due to MI specifically in Hispanics or Mexican Americans, but consistently reports mortality for non-Hispanic Black and White males and females (Go et al., 2013; Lloyd-Jones et al, 2010; Roger et al., 2011; Thom et al., 2006). The vast majority of research in CVD and MI examines non-Hispanic Black and White populations, yet Hispanics are the largest minority population in the U.S. (U.S. Census Bureau, 2011). The term "Hispanic" is a broad term used to describe the ethnic origins of a number of heterogeneous subgroups with different cultural health practices and beliefs. The U.S. population is over 232

million adults, with Hispanics representing 16.3% and Mexican Americans comprising 63% of Hispanics (U.S. Census Bureau, 2011).

The leading cause of death among U.S. Hispanics has been CVD (31.5% of Hispanic females and 27% of Hispanic males) (Lloyd-Jones et al., 2010). Premature death in those younger than 65 years of age due to CVD has been higher among Hispanics (23.5%) than non-Hispanics (16.5%) (Thom et al., 2006).The San Antonio Heart study concluded the age and gender-adjusted hazard ratios comparing Mexican American mortality with non-Hispanic White mortality were as follows: all-cause mortality 1.50 (95% CI), cardiovascular mortality 1.70 (95% CI), and CAD mortality 1.60 (95% CI) (Hunt et al., 2003). The Corpus Christi Heart Project found the extent of death attributable to CHD among Mexican Americans compared with non-Hispanic Whites were 36% greater among Mexican American women and 12% greater among Mexican American men (Pandey, Labarthe, Goff, Chan, & Nichaman, 2001). Both of these studies concluded the burden of CHD mortality was greater for Mexican Americans than non-Hispanic Whites (Hunt et al., 2003; Pandey et al., 2001). Otiniano et al. (2003) studied 3,050 Mexican Americans $\geq$ 65 years of age in the Hispanic Established Population for the Epidemiological Study for the Elderly to examine the rate of self-reported MI and found 42.4% of MI victims had died of an MI by the seven-year follow-up.

The high rate of risk factors for CVD and co-morbidities predisposes Mexican Americans to cardiovascular events such as MI. Mexican Americans have higher rates of

obesity, diabetes mellitus, metabolic syndrome, dyslipidemia, and untreated hypertension compared to non-Hispanic Whites (Davidson et al., 2007; Hunt et al., 2003; Pandey et al., 2001). Orlander et al. (1994) examined data from the Corpus Christi Heart Project from 1,199 participants and found 54% of Mexican Americans experiencing an MI had diabetes, while the prevalence of diabetes among non-Hispanic Whites experiencing an MI was 33%. The morbidity of Mexican Americans is worse than that of non-Hispanic Whites, as Mexican Americans have higher rates of chronic disease, poor health, lower quality of life, and physiological aging is preceding chronological aging (Wallace & Villa, 2003). It is estimated about 85% of elderly Mexican Americans have at least one chronic disease and this can impair daily function including activities of daily living (ADL) and instrumental ADLs (IADL) (household functions like cooking) (Wallace & Villa, 2003). Otiniano et al. (2003) found of those elderly Hispanic participants that experienced an MI, the frequency of having disabilities in ADL and IADLs was more likely with an odds ratio of 2.91 compared to participants that had not experienced an MI.

The voice of Mexican Americans has not been captured. We do not understand what benefits they see in seeking emergency care when experiencing MI symptoms and what barriers they must overcome to seek this care (DuBard, Garrett, & Gizlice, 2006; Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008). A dearth of research exists on the perceived factors that influence EMS activation during MI in the Mexican American population. Qualitative studies exclusive to Mexican Americans are scarce in MI symptom knowledge, pre-hospital delay, EMS activation, and treatment-seeking

behavior (DuBard et al., 2006; Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008). The research that has been conducted, primarily quantitative in nature, has not been able to reduce the pre-hospital and outcomes of MI in Mexican Americans. Understanding the voice of Mexican Americans through qualitative research and an emic approach can begin to finally improve MI outcomes and disparities that quantitative approaches have failed to improve.

In Texas, Mexican Americans comprise 88% of the Hispanic population (37% of state population) (Pew Hispanic Center, 2009). Researchers need to examine perceived benefits and barriers to seeking cardiac emergency care during an acute MI to thoroughly understand the continued disparities between Mexican Americans and other populations and develop culturally competent interventions. Long-term outcome measurement, such as reduction in time from MI symptom onset to arrival at an emergency department and an increase in the number of individuals with preserved cardiac function when discharged home post-MI should be included as outcome measures in future research. A *Healthy People 2020* objective is to increase the proportion of adults who are aware of and act during the early warning signs and symptoms of an MI to immediately activate EMS for the initiation of demonstrated life-saving interventions from 92.9% (in 2008) to 94.9% (CDC, 2011).

Purpose

The purpose of this study was to describe perceived benefits and barriers to seeking cardiac emergency care including EMS activation during an acute MI in Mexican

American adults. Specific Mexican American health beliefs regarding benefits and barriers of health-seeking behavior during an acute MI are not readily available in the literature. Identifying and increasing understanding of the perceived barriers and benefits to seeking emergency care for symptoms of MI in Mexican American adults will assist researchers and health care providers to more effectively target evidence-based interventions to decrease delay in seeking emergency care.

Aim

The aim of this study was to describe the experiences of Mexican American adults in seeking emergency care including EMS activation at the onset of MI symptoms.

Research Question

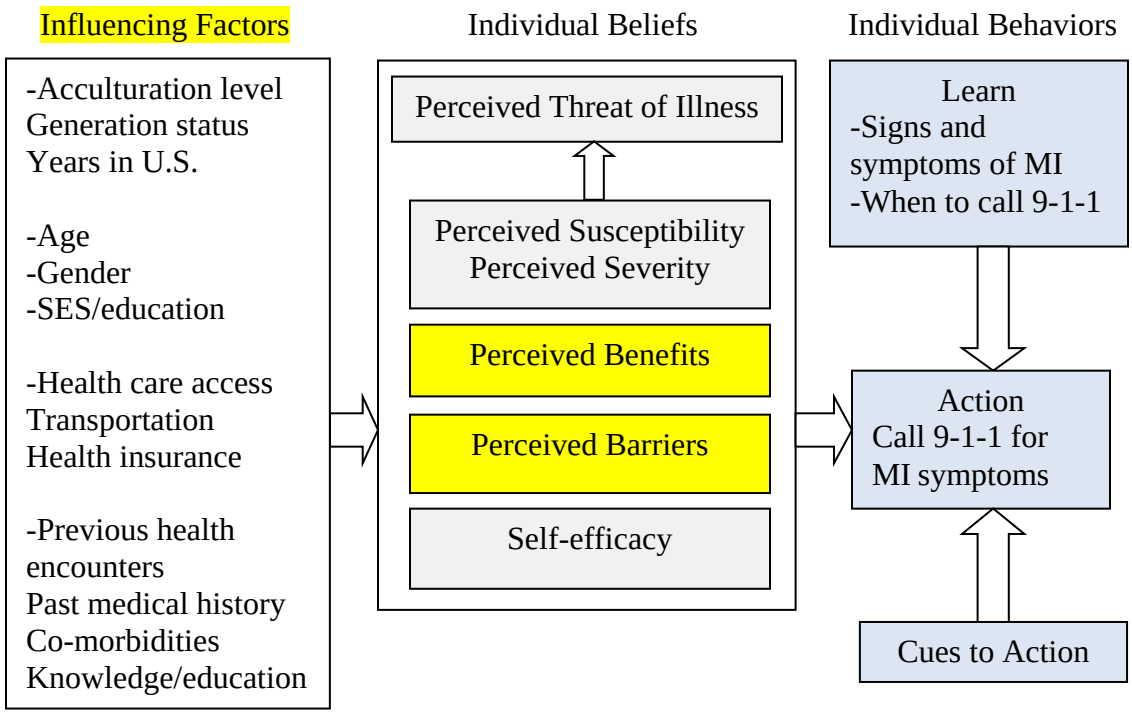
The research question addressed in this study was: What are the factors that affect Mexican American adults' actions in response to MI symptom onset?

Model

The Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction is a population-specific model used to identify concepts concerning the Mexican American experience with MI. The conceptual model in Figure 1 (with areas highlighted in yellow indicating primary focus of this research question), was modified from the Health Belief Model (HBM) (Becker et al., 1977; Champion & Skinner, 2008; Janz & Becker, 1984) adding modifying factors such as acculturation, health care access, and previous health encounters which all influence the individual beliefs of Mexican Americans in recent research. The HBM is a grand theory and does

not address modifying factors specific to Mexican Americans. The conceptual model influences the description of the factors affecting actions taken in response to MI symptom onset. These factors included influencing factors, individual beliefs, and individual behaviors. The Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction attempts to describe influencing factors and individual beliefs that affected MI recognition and treatment-seeking behavior in Mexican American adults.

Figure 1. Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction



Note. MI = myocardial infarction; SES = socioeconomic status.

The HBM is based on psychological and behavioral theory. The theory attempts to explain behavior regarding disease-avoidance, disease symptoms, sick-role behavior,

and medical regimen adherence (Becker et al., 1977; Becker et al., 1978). The threat of illness influences the individual's readiness to act and consists of perceived susceptibility and perceived severity (Becker et al., 1977). The interaction between perceived susceptibility and perceived severity largely determines a specific health action and is stated in the following formulas by Becker, Haefner, et al. (1977, p. 29):

"Susceptibility + severity = threat or 'readiness to take action.'

Benefits – barriers = possibility of threat reduction."

The potential benefits of reducing the threat of illness components are weighed against the potential barriers to performing the health action (Becker et al., 1977). Self-efficacy is an individual's belief in their own abilities to complete the action (Janz & Becker, 1984). Cues to action are the internal (physical symptoms) and external (mass media) cues that awaken an individual's consciousness to the threat and prompt action (Becker et al., 1978). The HBM attempts to explain observable health behaviors that are affected by attitudes and beliefs (Janz & Becker, 1984). As strong as the HBM is for understanding the actions of some populations, the HBM lacks influencing factors specific to Mexican American adults.

Understanding the complex influencing factors and individual beliefs of Mexican Americans can impact health care professionals' effectiveness in educating the population on recognition of MI symptoms and rapid lifesaving action to take in the event of such symptoms. The influencing factors that were explored include acculturation, age, gender, socioeconomic status (SES) and education, access to health care, and previous

health encounters. A summary of the literature supporting the proposed theoretical relationships depicted in the modified model are presented in Chapter 2. It must be noted that there are some relationships that have yet to be explored in Mexican American samples; therefore, studies with other samples are included as needed to describe these relationships.

In this modification of the HBM, influencing factors affect the individual's beliefs. The individual's perceived threat to illness is comprised of the perceived susceptibility and perceived severity of illness. The individual's beliefs affect the probability that he/she will recognize MI signs and symptoms, and the individual beliefs and recognition of signs and symptoms affect the individual behaviors and actions taken in response to MI symptom onset. The focus of this study was on the perceived benefits and barriers to seeking cardiac emergency care including EMS activation at the onset of MI symptoms. Based on the findings of this qualitative study, recommendations for the revision of the model and future research are presented.

The major concepts and definitions of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction are displayed in Table 1.

Definition of Terms

Cardiovascular Disease (CVD)

CVD is a group of cardiac and blood vessel disorders that encompass hypertension, stroke, coronary heart disease (CHD) (MI and angina pectoris), heart

Table 1.

Major Concepts and Definitions of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction

Concept	Definition
	Influencing Factors
Acculturation level	Multidimensional process encompassing alteration of cultural traits that occurs after exposure to another culture.[a] Includes language spoken, generation status, and years living in United States (U.S.).
Age	The amount of time a person has lived.
Gender	The social and cultural state of being male or female.
SES/education	Commonly measured by years of education, level of income, and type of occupation.[b]
Health care access	Availability, accessibility, and acceptability of level of care required to optimize myocardial infarction (MI) outcomes.
Previous health encounters	Provider visits, co-morbidities, health knowledge of MI, and health care experiences of the individual and contacts.
	Individual Beliefs
Perceived susceptibility	One's perception of likelihood or risk of MI.[c]
Perceived severity	Perception of seriousness in MI, including medical consequences (disability, pain, death) and social consequences (effects on occupation, family, and social relations).[c]
Perceived threat	One's subjective readiness to take action as determined by perceived susceptibility and perceived severity.[c]
Perceived benefits	Belief and value of the advised action in reducing the perceived threat of an MI or health demise. May include preservation of quality of life, financial savings, and positive feeling of helping others and/or self.[c]
Perceived barriers	Beliefs and estimates concerning the costs of the advised action. May include language barrier, physical (perceived lack of transportation), financial (cost of emergency care), and psychological (fears) costs.[c]
Self-efficacy	Confidence in one's ability to successfully accomplish the required behavior. May include learning the signs and symptoms of an MI.[c]

Table 1. (continued)

	Individual Actions
Cues to action	A relevant stimulus or strategy to trigger the advised health behaviors. May be internal (MI symptoms) or external (knowing someone who has had an MI, mass media, health communications, and interpersonal communications).[c]
Learn	To gain knowledge of the signs and symptoms of an MI and when to call 9-1-1.
Action	Act of calling 9-1-1 for MI symptoms.

[a] = Phinney, 1996. [b] = Barr, 2008. [c] = Becker, Maiman et al., 1977; Janz & Becker, 1984; Rosenstock et al., 1988.

failure, stroke, and congenital cardiovascular defects (Roger et al., 2011). Approximately 50% of CVD consists of CHD (Lloyd-Jones et al., 2010).

Coronary Heart Disease (CHD)

CHD includes: MI, acute coronary ischemia, chronic ischemic heart disease, angina pectoris, and atherosclerotic CVD (Roger et al., 2011; Thom et al., 2006).

Emergency Medical Service (EMS)

EMS is the immediate mobile emergency health care services that often arrive at the patient's location via ambulance. EMS personnel are capable of providing emergency medical services to save a patient's life and stabilize them while providing immediate transportation to the closest hospital meeting the patient's health care needs. In the U.S., these services are initiated by calling 9-1-1.

Fatalism

Fatalism is the belief that health and illness are predetermined or predestined by a higher power and outside non-human force (Roncancio, Ward, & Berenson, 2011).

Hispanic Americans

The U.S. Census Bureau (2011) defines “Hispanic” or “Latino” as a person with familial descent or origins from Mexican, Cuban, Puerto Rican, South or Central American, or another Hispanic origin, apart from race. Hispanics comprise 16.3% of the U.S. population and are the largest minority group (Stone & Balderrama, 2008; U.S. Census Bureau, 2011). As stated by the U.S. Census Bureau (2011), Hispanic Americans include 63% Mexicans, 9.2% Puerto Ricans, 7.9% Central Americans, 5.5% South Americans, 3.5% Cubans, and 2.8% Dominicans, and 8.1% of other Hispanic origin.

Mexican Americans

Mexican Americans are people who identify themselves as being Hispanics of Mexican origin (Pew Hispanic Center, 2011). Mexican Americans may be immigrants from Mexico or they are able to trace their family ancestry back to Mexico (Pew Hispanic Center, 2011). Mexicans are the largest sub-population of Hispanics living in the United States, accounting for 63% of the U.S. Hispanic population (U.S. Census Bureau, 2011). About 36% of Mexican Americans are foreign born, but 64% of immigrants from Mexico came to the U.S. in 1990 or later (Pew Hispanic Center, 2011). According to the Pew Hispanic Center (2011), almost one-quarter (23%) of Mexican immigrants are U.S. citizens.

Language Spoken

English-Speaking

English-speaking is the primary language of an individual and may include the language chosen to complete a verbal or written interview (versus Spanish-speaking) (DuBard & Gizlice, 2008).

Spanish-Speaking

Spanish-speaking is the primary language of an individual and may include the language chosen to complete a verbal or written interview (versus English-speaking) (DuBard & Gizlice, 2008).

Metabolic Syndrome

Metabolic syndrome represents a cluster of risk factors for CVD and type II diabetes mellitus. Metabolic syndrome is diagnosed when three of the following five risk factors are present (or are currently undergoing drug treatment): fasting plasma glucose of $\geq$ 100 mg/dL, high density lipoproteins (HDL) cholesterol > 40 mg/dL in men or > 50 mg/dL in women, triglycerides $\geq$ 150 mg/dL, systolic blood pressure $\geq$ 130 mm Hg or diastolic $\geq$ 85 mm Hg, or waist circumference of $\geq$ 102 cm in men or $\geq$ 88 cm in women (Roger et al., 2011).

Myocardial Infarction

MI is defined as an irreversible cardiac cellular death caused by prolonged ischemia (greater than 15 minutes) (AHA, 2005). The term MI includes the term ‘acute

MI' (AMI) and the more specific types of both non-ST-elevation myocardial infarction (NSTEMI) and ST- elevation myocardial infarction (STEMI) (O'Connor et al., 2010).

Pre-Hospital Delay

Pre-hospital delay is the time period from the onset of MI symptoms to EMS reaching the patient or the patient reaching the hospital by means other than EMS for treatment. Pre-hospital delay during MI may operate at any of the following stages: symptom awareness, recognition of symptom gravity and severity, and the decision to activate EMS (Gärtner et al., 2008). Potential delays in MI treatment can occur during the onset of MI symptoms to patient recognition of symptoms (pre-hospital delay), during pre-hospital transportation, and during evaluation in the emergency department (O'Connor et al., 2010). Pre-hospital delay often constitutes the longest period of treatment delay due to lack of patient recognition of MI symptoms (O'Connor et al., 2010).

Risk Factors for MI

Risk factors include hypertension, hyperlipidemia, diabetes mellitus, smoking, abdominal obesity (body metabolic index $\geq$ 30.0 kg/m$^{2)}$, a lack of physical activity, low daily consumption of fruit and vegetables, and alcohol overconsumption (Roger et al., 2010). More specific guidelines for hyperlipidemia risk factors include a total serum cholesterol levels $\geq$ 240mg/dL (total serum cholesterol levels of 200 to 239 mg/dL are considered borderline), a triglyceride level of > 150mg/dL, low density lipoprotein (LDL) $\geq$ 130 mg/dL, and HDL < 40 mg/dL (Roger et al., 2010).

Socioeconomic Status (SES)

SES is defined as a complex measure of education, annual household income, and occupation (Barr, 2008). SES directly affects the neighborhood a household may be situated in, which in turn often affects social (i.e. propensity to be affected by violence, social status) and health opportunities (i.e. available primary care provider, availability of fresh fruits and vegetables in grocery store) (Barr, 2008). Low SES is defined as not having enough money to pay for the things an individual needs, including medications.

Symptoms (Atypical & Typical)

Atypical MI Symptoms

Atypical symptoms are the more unusual symptoms experienced during an MI and are more common in women, those older than 65 years of age, and those with diabetes (O'Connor et al., 2010; Tullmann, Haugh, Dracup, & Bourguignon, 2007). Atypical MI symptoms include dyspnea, dizziness, unexplained fatigue, nausea/vomiting, abdominal pain, heartburn, and confusion (AHA, 2010; Tullmann et al., 2007).

Typical MI Symptoms

Typical MI symptoms include the classic chest pain or pressure, pain or discomfort in the arms or shoulder, pain or discomfort in the jaw or pain, pain or discomfort in the back, shortness of breath, and feeling weak, lightheaded, or faint (AHA, 2005; DuBard et al., 2006; Lutfiyya, Cumba et al., 2008). The predominant symptoms people experience are often chest or upper body discomfort and dyspnea (O'Connor et

al., 2010). Typical MI symptoms are those people associate with an MI and are more well-known than atypical symptoms.

Assumptions

1. Individuals perceive the environment around them.
2. Individuals are self-reflective and consider consequences before taking action.
3. Internal evaluation of abilities determines levels of self-efficacy in performing actions.
4. Environmental factors influence actions of the individual.
5. Individual that have experienced an MI will accurately and truthfully relay their thoughts and experiences surrounding pre-hospital experiences.

Limitations

1. All participants were under the care of a cardiologist; therefore these participants may have had different experiences than those without specialized care.
2. Including only English-speaking individuals does not allow for capture of the experience of non-English-speaking Mexican Americans.
3. Individuals were asked to self-report their experiences following the onset of MI symptoms and through diagnosis and may not have reported all their perceptions.

Summary

The leading cause of death among Mexican Americans is CVD. Compared to non-Hispanic Whites, Mexican Americans have a higher mortality burden from CHD and higher rate of premature death from CVD. The disproportionate number of risk factors

for MI among the Mexican American population presents a potential disparity in MI mortality. The serious lack of MI research among Mexican Americans has not afforded researchers or health care professionals with a complete picture of the scope of MI in the population. There is a dearth of research in regard to Mexican Americans and their perceptions of the benefits and barriers to the initiation of emergency cardiac care during MI. Researchers need to study the perceptions of Mexican Americans to understand their perspective before we can educate health care professionals and implement interventions in efforts to effectively decrease pre-hospital delay during MI.

Use of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction guided the selection of the main questions during the interviews with research participants. Through a review of the literature, the intention of the model was to be a population-specific guide for the potential factors affecting the perceived benefits and barriers of Mexican Americans to seeking emergency care at the onset of MI symptoms. This study highlights revisions that are necessary in the model and reinforce influential concepts that are congruent with the realities of Mexican American perceptions during and MI experience.

Chapter 2: Review of Literature

The purpose of this literature review is to explore the factors reported to affect treatment-seeking and decision-making in Mexican American adults experiencing myocardial infarction (MI) including the activation of emergency medical services (EMS) and emergency care. This literature review follows the conceptual model of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction (Figure 1). This revision of the Health Belief Model (HBM) (Becker, Haefner, Kasl, Kirscht, Maiman, & Rosenstock, 1977; Champion & Skinner, 2008; Janz & Becker, 1984) is based on the specific factors involved with MI and the Mexican American adult population as reported in both current and select classic literature. The influencing factors to be explored include acculturation, language spoken, education, socioeconomic status (SES), access to health care, and previous health encounters. Each factor within the individual beliefs concept are presented including: perceived susceptibility of illness, perceived severity of illness, perceived threat of illness, perceived barriers, perceived benefits, and self-efficacy. Cues to action and the desired action of EMS activation during MI are discussed within the context of the Mexican American adult population.

Influencing Factors

Influencing factors are those factors that affect one's individual health perceptions (Champion & Skinner, 2008). Influencing factors include demographic factors like ethnicity, gender, and age or influencing factors may be sociopsychological like acculturation (Becker, Maiman, Kirscht, Haefner, & Drachman, 1977). The potential for

intervention between the multiple influencing factors, individual health beliefs, and the desired action of emergency services activation presents exciting future research opportunities (Becker, Haefner et al., 1977). Understanding the complex influencing factors and individual beliefs of Mexican Americans can impact health care professionals' effectiveness in educating the population and implementing effective interventions. The influencing factors to be explored include acculturation, age, gender, SES and education, access to health care, and previous health encounters.

Acculturation Level

Acculturation is a multidimensional process encompassing the alteration of cultural traits that occurs after exposure to another culture (Phinney, 1996). Acculturation includes language, incidence of disease, risk of cardiovascular disease (CVD), health behaviors, and beliefs and attitudes about seeking health care. There is disagreement among researchers about how to measure acculturation. One of the most widely used acculturation scales for Mexican Americans is the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) developed by Cuellar, Arnold, and Maldonado (1995). The ARSMA-II measures language use and preference, ethnic identity and behaviors, ethnic interaction, and cultural heritage (Coronado, Thompson, McLerran, Schwartz, & Koepsell, 2005; Cuellar et al., 1995). Of the nine acculturation scales reviewed by Coronado et al. (2005), each one measures language use.

Language may be a barrier to the recognition of MI symptoms in Spanish-speaking Mexican Americans (DuBard, Garrett, & Gizlice, 2006). The Pew Hispanic

Center (2004) reported 40% of United States (U.S.) Hispanics speak primarily Spanish and 14% speak primarily English. The Institute of Medicine (Smedley, Stith, & Nelson, 2003) reported that 25.8% (or 4,560,000) of Hispanics live in linguistically isolated households in which no adults spoke English "very well," and that percentage has increased. About 53% of Hispanics described themselves as speaking English well or very well in a Pew Hispanic Center Survey (2004). In the state of Texas, 78% of Mexican Americans speak a language other than just English at home (Pew Hispanic Center, 2009). In the U.S., MI educational materials are not consistently available in Spanish, thus language may be a contributor to delayed decision-making during an MI.

Acculturation can also influence the incidence of disease (Coronado et al., 2005) and risk factors for CVD (Edelman, Christian, & Mosca, 2009). Foreign-born Mexican Americans often have low CVD risk factors compared to more acculturated Mexican Americans. U.S.-born Mexican Americans have increased cigarette smoking, body mass index and abdominal obesity, hypertension, diabetes, and cholesterol compared to foreign-born Mexican Americans (Morales, Leng, & Escarce, 2009; Sundquist & Winkleby, 2000). In a study examining Mexican American country of birth and acculturation status among men and women, Spanish-speakers born in the U.S. were found to have the highest abdominal obesity compared to U.S.-born English speakers and Mexico-born men and women, with the later having the smallest waist circumference (Sundquist & Winkleby, 2000). In the National Health and Nutrition Examination Survey III, Sundquist and Winkleby (1999) found the same pattern of prevalence in estimated

CVD risk morbidity with U.S-born Spanish-speaking Mexican American men and women having the highest CVD risk (27.5% and 11.4% respectively) and Mexico-born men and women having the lowest CVD risk mortality (20.0% and 6.0%). Sundquist and Winkleby hypothesized a possible healthy migrant theory or the stress of second generation Mexican American intergenerational conflicts and marginalization may account for the differences in CVD risk factor profiles and number of CVD risk factors. Morales et al. (2009) found second generation Mexican American men and women both had higher rates of hypertension than their first generation counterparts. Acculturation of Mexican Americans is associated with an increased rate of chronic disease, smoking, intake of saturated fat, decreased intake of fruits and vegetables, decrease in daily fiber intake, and decreased physical activity (DuBard & Gizlice, 2008; Edelman et al., 2009).

One's level of acculturation can affect individual beliefs and attitudes about seeking health care (Coronado et al., 2005). In a cross-sectional study of minorities whose family members were hospitalized for atherosclerotic CVD (N = 179, 65% Hispanic), the association between acculturation and health beliefs was measured based on descriptions in the HBM (Edelman et al., 2009). Edelman and colleagues (2009) found less acculturated minorities had more fear about CVD screening than more acculturated minorities. Edelman et al. stated less acculturated minorities also expressed an external locus of control regarding CVD prevention in which a doctor, God, or a higher power has more power rather than an internal locus of control (expressed by more acculturated minorities). Christian et al. (2007) and Mosca et al. (2006) found similar results in which

significantly more Hispanic women than non-Hispanic White women reported there was nothing they could do about CVD risk factors or CVD prevention.

In a recent Texas study, researchers examined the relationship between acculturation and fatalism within the context of health care provider (HCP) control expectations among Hispanic women (N = 1,027) (Roncancio, Ward, & Berenson, 2011). HCP control expectations were defined as the degree to which individuals believe that HCPs have control over the individual's health (Roncancio et al., 2011). Roncancio et al. (2011) found a positive association between fatalism and HCP control expectations ($p <$ .001, r = .761). Roncancio's results revealed acculturation and HCP control expectations were negatively associated ($p <$ .001, r = -.384); a one point increase in acculturation was associated with a decrease of 0.22 in HCP control expectations among Hispanic women. Highly fatalistic women believed health is predetermined and they were less likely to seek health care services or health care screening than less fatalistic women (Roncancio et al., 2011).

Age

Age contributes as an influencing factor in three ways: 1) the time it takes from onset of MI symptoms to seeking emergency care (pre-hospital delay) is different between age groups, 2) number of co-morbidities increase with age, and 3) knowledge and awareness of modifiable risk factors realistic risk for CVD.

The literature is equivocal when discussing the association between pre-hospital delay and age of the patient. There are varying definitions of older and younger

participants, but older was usually defined as starting at 55 years to 65 years of age. The median duration of pre-hospital delay is significantly increased among older individuals compared to younger individuals in some studies (Alonzo, 2007; Zapka et al., 2000).

In a mixed methods study with 48 mostly non-Hispanic Black women, Harralson (2007) examined demographic, cognitive, and psychosocial factors that impact the decision to seek emergency care during an MI. Harralson found a longer pre-hospital delay among younger participants than older participants. A comparative study examining the gender differences in reasons people delay seeking treatment during an MI (N = 194) revealed delay was longer specifically in older women compared to younger women (Moser et al., 2005). Moser et al. (2005) stated there was no difference in pre-hospital delay among men of different ages.

A number of studies have found no significant difference in pre-hospital delay according to age. In a study with 100 (n = 91 non-Hispanic White) individuals who experienced an MI, Quinn (2005) found age was not a significant predictor in seeking emergency treatment during an MI. A mixed-method study with 52 women (n = 43 White, n = 1 Hispanic, n = 5 non-Hispanic Black, n = 2 Asian, n = 1 more than one race) describing decision trajectories and predictors in women with MI symptoms concluded there was not a significant difference in pre-hospital delay according to age among women (Rosenfeld, 2004). Sullivan and colleagues (2009) aimed to determine if patients with a low level of trust in others have an increased intention to delay seeking emergency care in an MI. Sullivan et al. found that among 796 individuals scheduled for an imaging

stress test, age was not a significant factor in the intention to delay pre-hospital emergency care. Tullmann et al. (2007) conducted a randomized controlled trial among 115 participants ≥ 65 years with coronary artery disease to measure knowledge, beliefs, and perceived control during an MI after a teaching intervention with significant increases in each factor.

Most studies included in a recent review of 42 articles examining age and sex differences associated with pre-hospital delay in MI concluded there is an increased pre-hospital delay in seeking emergency care among the elderly (Nguyen et al., 2010). In patients ≥ 65 years hospitalized for an MI the median pre-hospital delay from symptom onset ranged from 1.4 to 3.6 hours (Nguyen et al., 2010). Nguyen et al. (2010) reported younger patients experiencing an MI had a pre-hospital delay ranging from 1.1 to 2.8 hours.

The average number of cardiac and non-cardiac co-morbidities a person has generally increases with advancing age (Chen et al., 2013; McManus, Nguyen, Saczynski, Tisminetzky, Bourell, & Goldberg, 2012). Multiple co-morbidities increase the propensity for an MI and are associated with a higher incidence of 30-day mortality post-MI (Chen et al., 2013; McManus et al., 2012). At the time of their first MI, women's age often exceeds that of men by about seven to 10 years, and these older women more frequently have the co-morbidity of diabetes mellitus (Patel et al., 2004; Zerwic et al., 2003). The elderly, women, and diabetics are inclined to experience more atypical MI

symptoms than MI victims that are less than 65 years of age, men, and non-diabetics (Nguyen et al., 2010; O'Connor et al., 2010).

Lack of awareness of influencing risk factors for CVD and realistic risk for CVD and MI contributes to CVD prevalence. In a Texas study among Mexican Americans $\geq$ 65 years the prevalence of hypertension was 60%, while the lack awareness of participants' own hypertension was 37% (Satish et al., 1997). Older Mexican Americans that were unaware of their existing hypertension had significantly higher blood pressure, than participants that were aware of their hypertension (Satish et al., 1997).

Gender

Gender contributes as an influencing factor in two ways: 1) the occurrence and knowledge (layperson and HCP) of typical and atypical MI symptoms and 2) the pre-hospital delay to seek emergency care after MI symptom onset is different between men and women.

The literature contains little consensus on how gender is associated with MI symptom knowledge and the initiation of EMS or emergency care during an MI. Women often experience atypical MI symptoms in addition to more typical symptoms like chest pain (Arslanian-Engoren, 2005; O'Connor et al., 2010; Patel et al., 2004). Patel et al. (2004) reviewed 15 studies on acute coronary syndrome and found men having an MI reported more chest pain and diaphoresis than women. Compared to men, women had more pain in the back, jaw, and neck and nausea/vomiting, loss of appetite, indigestion, dizziness, syncope, fatigue, dyspnea, and palpitations (Patel et al., 2004). These atypical

symptoms are lesser known and not what HCPs and laypeople think of when they picture an MI. This incongruence of expected and actual MI symptoms can lead to a delay in symptom recognition and treatment (Finnegan et al., 2000; Gärtner, Walz, Bauernschmitt, & Ladwig, 2008; Patel et al., 2004; Zerwic, Ryan, DeVon, & Drell, 2003).

Women have more pre-hospital delay prior to seeking emergency care during an MI than men in the majority of research studies (Banks & Dracup, 2006; Nguyen et al., 2010; Patel et al., 2004). Nguyen and colleagues (2010) reviewed the age and sex differences of 42 studies on the time of pre-hospital delay in hospitalized MI victims. Nguyen et al. reported the median pre-hospital delay for men ranged from 1.4 to 3.5 hours, while the pre-hospital delay for women experiencing an MI was 1.8 to 7.2 hours. Patel and colleagues (2004) reviewed 15 studies including both men and women with identified acute coronary syndrome symptoms and offered that women may not realize their symptoms have a cardiac origin, because they experience more ambiguous symptoms than men do. Furthermore, when women with MI symptoms seek care, they are often misdiagnosed with a non-cardiac diagnosis, further delaying MI treatment (Patel et al., 2004).

There is no significant difference in median pre-hospital delay among men and women in several studies (Banks & Dracup, 2006; Moser et al., 2005; Quinn, 2005; Sullivan et al., 2009). Two studies reported specific pre-hospital delay according to

gender; the median range in men was 3.08 hours to 3.50 hours, while the range in women was 3.10 hours to 4.42 hours (Banks & Dracup, 2006; Moser et al., 2005).

In many studies, women are more likely to seek medical care and health services than men (Patel et al., 2004; Satish et al., 1997). Results of a two-year prospective cohort study among Mexican Americans $\geq$ 65 years (N = 1,987) revealed female sex, older age, insurance coverage, and existing medical conditions were the most influential determinants of health care use (Al Snih et al., 2006). Overall, men do not practice preventative actions as frequently as women; Satish et al. (1997) in a study with 3,050 Mexican Americans $\geq$ 65 years to ascertain factors associated with the unawareness of hypertension found men were more frequently unaware of their hypertension than women (OR 1.8).

Women experiencing a first MI tend to be older than men by about seven to 10 years and more frequently have diabetes mellitus (Patel et al., 2004; Zerwic et al., 2003). The elderly, women, and diabetics tend to have more atypical MI symptoms than MI victims that are younger than 65 years, men, and non-diabetics (Nguyen et al., 2010; O'Connor et al., 2010). Atypical MI symptoms and a lack of awareness of the potential susceptibility to CVD may both contribute to pre-hospital delay in women. Though CVD is the most frequent cause of death among women, many women think the most frequent cause of death among women is breast cancer (Christian, Rosamond, White, & Mosca, 2007; Mosca et al., 2006; Patel et al., 2004).

Socioeconomic Status (SES) and Education

SES contributes as an influencing factor in five ways: 1) health and SES have a positive correlation, 2) a large percentage of Mexican Americans have a low annual household income, 3) twice as many Spanish-speaking Mexican Americans than English-speaking Mexican Americans have a low annual household income, 4) low SES and coronary heart disease (CHD) risk factors have a negative correlation, and 5) Mexican Americans with a low SES tend to have a low knowledge of the need for preventative care and when the need exists to seek health care.

Years of education, level of income, and type of occupation are often used as a composite measure of SES (Barr, 2008). The low SES of many Mexican Americans negatively affects their health (Barr, 2008; Mensah, Mokdad, Ford, Greenlund, & Croft, 2005). Mensah and colleagues (2005) used the Behavioral Risk Factor Surveillance Survey (BRFSS), the National Health and Nutrition Examination Survey, the National Health Interview Survey, and the National Center for Health Statistics to examine the prevalence of CVD and risk factors, morbidity, mortality, health disparities, and the quality of life of adults according to demographics. Heart disease and hypertension were found to be negatively correlated with income, education, and poverty status (Mensah et al., 2005). Mensah et al. reported the highest prevalence of poor health exists among Mexican Americans.

The 2003 to 2005 BRFSS showed 60.2% to 65.5% of Hispanic annual household incomes were under $35,000 (Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al.,

2008). In a study examining BRFSS information among 45,076 Hispanics to compare health indicators by primary spoken language, DuBard and Gizlice (2008) found that compared to English-speaking Hispanics, over twice as many Spanish-speaking Hispanics earn an annual household income less than $15,000.

Health disparities remain pervasive issues in the U.S. and influence MI symptom awareness. Thom et al. (2006) reported that people earning an income $\geq$ $50,000 have the lowest prevalence of CHD risk factors (28.8%), while the highest prevalence of CHD is among people that earn an income $\leq$ $10,000 (52.2%). Hayes et al. (2006) found similar results in examining the BRFSS data of over 150,000 women; women with annual household incomes < $20,000 had $\geq$ 2 CHD risk factors at a rate three and a half times more than women with an annual household income $\geq$ $50,000.

Larkey and colleagues (2001) conducted a qualitative study with 90 insured Arizona Hispanics to explore cultural health-seeking behavior and patterns. Larkey et al. reported Hispanics with a low SES tend to have a significant knowledge gap in preventative care, benefits of early detection, and what constitutes serious symptoms in which treatment cannot be delayed. With a generally low SES, Mexican Americans may have low health knowledge and often do not know when to seek health care within the limited health care resources available (Larkey, Hecht, Miller, & Alatorre, 2001).

Education contributes as influencing factor in three ways: 1) people with less education have low knowledge of MI symptoms and necessary actions during an MI, 2)

less education is associated with more risk factors for CHD, and 3) less education is associated with less perceived susceptibility and severity to CVD.

People with less than a high school education have the lowest level of MI knowledge and the need to activate EMS (Centers for Disease Control and Prevention [CDC], 2008). In the *Healthy People 2010* database (CDC, 2008) 37% of individuals with less than a high school education have knowledge of all MI symptoms and the need to call EMS, compared to 50% of individuals at least some college education. Greenlund et al. (2004) used the BRFSS results from 61,018 people to explore public knowledge of MI symptoms and the recognition of necessary EMS activation. Results revealed only 6.3% of participants with less than a high school diploma knew all five major MI symptoms and the need to call EMS compared to 11.6% of those with more than a high school diploma (Greenlund et al., 2004). In another national survey, McGruder and colleagues (2008) also explored public knowledge of MI symptoms and the need to activate EMS among 33,059 people in the National Health Interview Survey. McGruder et al. revealed similar result patterns reporting 31.3% of participants with less than a high school diploma knew all five MI symptoms and the need to call EMS compared to 45.6% of those with more than a high school diploma (McGruder et al., 2008). Thus, individuals with fewer years of education have less knowledge of MI symptoms and the importance of activating EMS as compared to those with more years of education.

People with less than a high school education have more risk factors for CHD and MI than those with more years of education (Barr, 2008). Barnhart et al. (2009) studied

256 people (n = 159 Hispanic) with at least one CHD risk factor to explore the relationship among individual risk perception, health behaviors, and an index of risk for CHD. Barnhart et al. reported of those respondents at high risk for CHD ($\geq$ 3 cardiovascular risk factors), 35.1% had some college education, while 54.2% did not have any college education ($p < .03$). CHD risk factors are inversely related to education and SES, so as education and SES increase, CHD risk factors decrease (Barnhart et al., 2009). The 2003 BRFSS showed the prevalence of multiple risk factors varied from 25.9% among college graduates to 52.5% among those that did not complete high school (Thom et al., 2006). In a study examining the BRFSS data of 153,466 women to examine the prevalence of CHD risk factors and racial/ethnic disparities, Hayes et al. (2006) found women with less than a high school education were four times as likely to have two or more CHD risk factors compared to women with a college degree. Education is a factor in the health care disparity in MI risk factors and symptom recognition.

Using the 2003 to 2005 BRFSS, Lutfiyya et al. (2008; 2009) found more than one fourth of Hispanic women and about 30% of Hispanic men have less than a high school education. DuBard and Gizlice (2008) analyzed data from 45,076 Hispanics and found 18.4% of English-speaking Hispanics had less than a high school education compared to 59% of Spanish-speaking Hispanics. A recent review reported lack of education and low SES are inversely related to CHD risk factors and MI symptom knowledge in high-income countries like the U.S. (Clark, DesMeules, Luo, Duncan, & Wielgosz, 2009).

Mosca et al. (2006) studied 1,008 women's knowledge of CVD risk factors, risk perception, and barriers to cardiovascular health. Mosca and colleagues found a college degree in women was positively correlated with knowledge of a healthy blood pressure ($p < .05$), and female college graduates were significantly more likely to know what a healthy high density lipoprotein (HDL) cholesterol was compared to women with less than a college degree education. Christian and colleagues (2007) conducted a study through random-digit dialing among 1,005 women to compare women's knowledge of CVD awareness, knowledge, and perceptions with three previous surveys. Though women's knowledge of CVD has increased over time, a disparity in knowledge remains among Hispanic women, and the authors recommend concentrating education efforts on Hispanic high-risk populations (Christian et al., 2007).

Health Care Access

Health care access contributes as an influencing factor in three ways: 1) the health care benefits that accompany manual labor or blue collar jobs held by many Mexican Americans, 2) the health insurance status of many Mexican Americans, and 3) the cost of health care and relationship to the propensity to defer health care viewed as non-essential.

Health care access may be divided into availability, accessibility, and acceptability as Wallace and Villa (2003) outlined in their review of cultural and structural health care issues faced by Latinos $\geq$ 65 years. Availability is the physical presence, operating hours, and services offered by a health care facility (Wallace & Villa, 2003). Wallace and Villa define health care accessibility as the means by which people

are able to obtain health care services or the cost, whether insured or not. Acceptability is the satisfaction in the services offered according to the values and culture of the patient seeking care (Wallace & Villa, 2003). Though health care may be perceived to be available by health care bureaucracies, Mexican Americans may not have health care access for a number of reasons.

The household income of Mexican Americans is low, because many work in jobs that are blue collar, manual labor, service industry, and often lack medical benefits (Chowdhury, Balluz, Okoro, & Strine, 2006; MacNaughton, 2008; Smedley et al., 2003; U.S. Census Bureau, 2006). In a review of factors affecting Hispanic health care outcomes, Morales et al. (2002) cites Mexican Americans as having the highest proportion of high-risk/low status jobs of all Hispanics at 77%. In MacNaughton's (2008) review of the health-seeking behavior of Hispanic men, the author found the jobs held by Mexican Americans involve more high-risk working conditions, lack health insurance coverage, and health care is more often inadequate for Mexican American men compared to non-Hispanic Whites. Anywhere from 60% to 80% of undocumented (not citizens) Mexican American workers lack health insurance (MacNaughton, 2008; Ransford, Carrillo, & Rivera, 2010).

Meeting food and shelter needs may be a daily challenge, with 21.8% of the Hispanic population living below the poverty level compared to 12.6% of the total U.S. population (U.S. Census Bureau, 2006). A recent report by the Migration Policy Institute stated that the percentage of Mexican Americans living below the poverty level differs by

generational status with about 25% of Mexican Americans immigrants, 20.1% second generation, and 18.6% of third generation Mexican Americans living below the level of poverty (Brick, Challinor, & Rosenblum, 2011). Means of transportation to access health care and insurance may be lower priorities and fairly unattainable for many Mexican Americans.

Estimations show 35% of Hispanics are uninsured compared to 17.5% of the general population (Chowdhury et al., 2006; Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008; Mensah et al., 2005; Smedley et al., 2003). Over half of Spanish-speaking Hispanics lack health insurance or a primary HCP (DuBard et al., 2006). Lutfiyya et al. (2008; 2009) found 25.3% of Hispanic women and 20.5% of Hispanic men had deferred health care in the last year due to cost. Warda (2000) conducted focus group studies among 22 Mexican Americans to explore their perspective of culturally competent care. Health care may be deferred due to lack of insurance, high costs, discrimination, lack of bilingual caregivers, location, limited hours of operation, inconvenient appointments, and crowded waiting rooms with long waits (Warda, 2000). The literature is not conclusive about lack of insurance being the top reason for lack of health care access, but it is consistently a leading factor. In a qualitative study among 12 Hispanic community leaders and 96 community respondents to explore health care access among uninsured and undocumented immigrants, the top reason cited for lack of health care access was not lack of insurance, but it was the long waits of six to 12 hours (Ransford et al., 2010). Larkey et al. (2001) conducted focus group interviews among 90

Arizona Hispanics with health insurance to explore cultural norms for health-seeking behaviors and found even with insurance, one of the cited barriers to seeking care was still financial (lack of money, high deductibles, etc.).

In a recent study with 8,371 Mexican Americans using Medical Expenditure Panel Survey (MEPS) data to explore the communities where Mexican Americans live and the association with health care access, Gresenz et al. (2009) concluded Mexican American immigrants living in an area with more Spanish-speakers (than non-Spanish-speakers) have better access to health care than those living among a majority of English-speakers. The study also reported that for more acculturated uninsured, English-speaking Mexican Americans, living in Spanish-speaking communities was negatively associated with access to health care (Gresenz, Rogowski, & Escarce, 2009). Gresenz and colleagues reasoned communities with a high percentage of Spanish-speakers will often have local organizations to assist Spanish-speaking immigrants, the availability of Spanish-speaking or Hispanic HCPs, and individual social networks. In a study of the MEPS data from over 7,500 Hispanics to challenge the myth of a monolithic Hispanic population, Weinick et al. (2004) reported after 15 years of living in the U.S., Hispanics utilized health care services at the same rate or greater than U.S.-born Hispanics.

Spanish-speakers experiencing MI symptoms were found to be more likely than English-speaking Mexican Americans to defer seeing a physician due to cost, lack of health insurance, and language and cultural barriers (MacNaughton, 2008). DuBard and Gizlice (2008) differentiated lack of health insurance by primary language spoken,

finding 55.4% of Hispanic Spanish-speakers (total *n* = 17,827) lack health insurance compared to 23.3% of Hispanic English-speakers (total *n* = 27,249). Spanish-speakers are less likely to visit an emergency department (ED), ambulatory care clinic, have a personal HCP, or have seen an HCP in the last year due to cost (DuBard & Gizlice, 2008; Weinick, Jacobs, Stone, Ortega, & Burstin, 2004). In a survey of Los Angeles HCPs, over 51% thought patients did not adhere to the prescribed medical regimen due to a language or cultural barrier (Smedley et al., 2003).

Previous Health Encounters

Previous health encounters contribute as an influencing factor in four ways: 1) cultural values affect health care adherence and outcomes, 2) existing co-morbidities at onset of first MI, 3) past health care experiences affect health care-seeking behavior, and 4) MI symptom knowledge and EMS activation action.

Previous health encounters include: provider visits, health care experiences of the individual and contacts, co-morbidities, and health knowledge (of MI). Hispanics and Mexicans in particular have several cultural values which can affect health care adherence and outcomes: *confianza* (confidence or trust), *personalismo* (personalized care with intimacy), *respeto* (respect), and *familismo* (the individual's need to consult family) (Barron, Hunter, Mayo, & Willoughby, 2004; Larkey et al., 2001; Warda, 2000). Negative health care interactions with a lack of *confianza* and *personalismo* can lead to avoidance of the health system (Larkey et al., 2001).

Mexican Americans that do not find their cultural values reflected in the health care system try to access care elsewhere. Ransford et al. (2010) inquired about seeking health care in Mexico during participant interviews and found a number of participants had very positive experiences seeking health care in Mexico. Participants stated Mexican physicians were easier to access, cost less, spent time with patients, explained things carefully to patients, treated the cause of illness, and had a more holistic approach compared to physicians in the U.S. (Ransford et al., 2010). Participants explained U.S. doctors treated the symptoms of illness rather than the cause (treated by Mexican doctors) (Ransford et al., 2010). In a study among 796 patients to explore their intent to delay care during a cardiac event, Sullivan et al. (2009) reported the patient's perspective of the trustworthiness of others was positively associated with an intention to delay seeking care during acute coronary syndrome. In a study of 1,005 women, Hispanic women reported feeling less comfortable than Black and non-Hispanic White women talking with their HCP about preventative health and treatment options (Christian et al., 2007). In the same study, Christian et al. (2007) found Hispanic women were least informed about CVD.

Though individuals themselves may not have tried to access health care, they may have developed ideas about obtaining health care based on the experiences of family and friends, whether it is positive or negative ideas about Western medicine. In a qualitative study among 12 Hispanic community leaders and 96 community respondents to explore health care access among uninsured and undocumented immigrants, Ransford et al. (2010) reported about one-third of participants had not tried to access care from the local

hospital. Ransford and colleagues reported almost all participants relayed moving stories about friends, family, or co-workers experiencing long waits and poor health care. The top complaints cited by participants included: long waits 65%, cost 51%, language and communication issues 41%, and rudeness once being served and rushed through the health care process 35% (Ransford et al., 2010). In a qualitative study on perceptions of health care access with 23 Mexican American immigrant women, Horwitz et al. (2008) found 63% of the 139 comments on barriers to health care cited long waits, cost, perceived discrimination, immigration status, and limited access due to the proximity of the health care facility. The other comments on perceived barriers to health care addressed participants experience with language differences and lack of access to comprehensible information on health care and access (Horwitz, Roberts, & Warner, 2008).

Even when Mexican Americans are able to access health care, the health care they receive may be less than adequate. MacNaughton's (2008) review of the literature on health care access in Hispanic men cites the concept of 'medical pluralism' in which people with insurance may receive one type of care by attending HCPs and people without insurance receive care from HCPs in training. Ransford and colleagues (2010) found a number of participants cited going with family or friends to the hospital and witnessing the receipt of better health care with insurance than without.

In a recent systematic review of 42 articles, the following factors were associated with a pre-hospital delay in seeking treatment for MI: non-White race, low SES, low

knowledge about symptoms, history of angina, diabetes mellitus, and hypertension (Nguyen et al., 2010). Factors associated with a decreased delay time included having Medicare or private insurance, a history of MI, calling EMS, recognition of symptoms being cardiac in origin, and congruence between expected and actual symptoms (Nguyen et al., 2010).

Conflicting evidence exists in the literature concerning the association of co-morbidities and the initiation of emergency care during an MI. In a study with 61 people that had an MI in the last month exploring factors affecting pre-hospital delay, Banks and Dracup (2006) reported participants with diabetes had a greater pre-hospital delay than those not diagnosed with diabetes (7.29 hours vs. 3.50 hours). Findings from the Corpus Christi Heart Project revealed 54% of Mexican American participants had diabetes compared to only 33% non-Hispanic Whites (N = 1,199) (Orlander et al., 1994). Orlander and colleagues (1994) found diabetics had a cardiac history prior to their MI at an odds ratio of 1.4 (95% CI) compared to non-diabetics. Diabetics experiencing an MI had a higher relative risk of heart failure (RR 2.2, 95% CI) and a higher mortality rate than non-diabetics over the 44 months participants were followed in the study (37.4% vs. 23.3%) (Orlander et al., 1994).

Prior history of CHD, acute coronary syndrome, acute MI, or the presence of risk factors made no difference in the likelihood of calling EMS or pre-hospital delay (Alonzo, 2005; Quinn, 2005; Sullivan et al., 2009; Zapka et al., 2000). Sullivan et al. (2009) found no association between gender, age, diabetes mellitus, and prior MI with the

intention to wait to seek treatment during an MI. Research findings on the association of co-morbidities and delay in treatment-seeking behavior in MI are conflicting (n = 796). Co-morbidities for MI may positively or negatively affect pre-hospital delay time to treatment, but this topic warrants future research specifically in the Mexican American population due to the conflicting findings in the literature.

Objective 12-02 of the *Healthy People 2010* database is to increase the knowledge of MI symptoms and the importance of calling 9-1-1 to at least 50% for each race, ethnicity, gender, level of disability, and education level (CDC, 2008). This objective has been revised to the current HDS HP2020-16 in the *Healthy People 2020* database and now includes the rapid response to early MI symptoms (CDC, 2011). The revised use of verbs highlights the importance of the action of calling 9-1-1 during a MI rather than just knowledge of MI symptoms. Knowledge does not always lead to the desired action for numerous reasons (embarrassment, denial, lack of insurance, etc.).

Simply knowing the pattern and possible implications of the symptom of chest pain is not sufficient to cause someone to call 9-1-1 during a potential MI. DeVon et al. (2010) reported that 63.5% of 256 respondents did not report experiencing chest pain nor was chest pain predictive of time to MI treatment. Adults 65 years of age and older are more likely to experience atypical MI symptoms such as dyspnea, dizziness, and confusion rather than chest pain (Tullmann, Haugh, Dracup, & Bourguignon, 2007). The American Heart Association (AHA) has been campaigning to save lives through public education of the five typical MI symptoms: (1) chest pain or pressure, (2) pain or

discomfort in the arms or shoulder, (3) pain or discomfort in the jaw, neck, or back, (4) feeling weak, lightheaded, or faint, and (5) shortness of breath (AHA, 2005; DuBard et al., 2006; Lutfiyya, Cumba et al., 2008).

The U.S. population's knowledge of the five typical MI symptoms and the need to call EMS is increasing, but Mexican Americans and Hispanics overall have remained less knowledgeable than other ethnic groups. The BRFSS is a random-digit telephone survey in a collaborative effort between individual states and the CDC (Greenlund et al., 2004). The 2001 BRFSS results revealed non-Hispanic Whites had more than twice the MI knowledge of non-Hispanic Blacks and Hispanics (Greenlund et al., 2004). The 2001 National Health Interview Survey showed non-Hispanic Whites had ($p < .05$) greater recognition of all MI symptoms and the need to call EMS than Hispanics (McGruder et al., 2008). The BRFSS had a decoy symptom that one third of respondents incorrectly identified as an MI symptom (Greenlund et al., 2004; McGruder et al., 2008).

In a study of Hispanic participants, Lutfiyya et al. (2008; 2009) found 26.4% of Hispanic women ($n = 3,146$) and 40.0% of Hispanic men ($n = 2,023$) scored 50% or less on the BRFSS. DuBard et al. (2006) examined the effects of language on knowledge of all five MI symptoms and found non-Hispanic Whites had significantly greater MI knowledge than non-Hispanic Blacks and English-speaking Hispanics. When primary language spoken was differentiated, non-Hispanic Whites had 5.6 times the MI knowledge of Spanish-speaking Hispanics ($p < .001$) (DuBard et al., 2006).

The multiple influencing factors discussed are closely related. Acculturation status is closely linked to SES and education. Overall, the more acculturated one is, the higher their SES and education. Acculturation, SES, and education are closely related to health care access; the lower these factors are, the less likelihood one has health insurance and acceptable health care access. Low SES, education, acculturation, and lack of health insurance may be associated with negative past health care experiences with difficulty trying to navigate the health care system. All these influencing factors affect one's individual beliefs and ultimately the desired action of MI symptom recognition and EMS activation.

Individual Beliefs

Individual beliefs are the health perceptions affected by both influencing factors and cues to action (Champion & Skinner, 2008). Individuals' beliefs regarding illness and the ability to avoid illness in addition to the net perceived costs and benefits of health actions make up the overall concept of individual beliefs (Janz & Becker, 1984). Individual beliefs include the central concepts of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and self-efficacy.

Perceived Susceptibility to Illness and Perceived Severity of Illness

It has been reported that Mexican Americans may not perceive their risk of an MI being very high despite multiple risk factors. In a study among White, Black, and Hispanic participants, Homko et al. (2008) found no association between individuals with

high risk of CVD and their perceived CVD risk (n = 465). Though the study provided insight to the lack of individual association between high risk and perceived risk, Hispanics made up only about 3% of the study sample (Homko et al., 2008). In a study exploring risk perceptions among 79 inpatients with MI, Broadbent and colleagues (2006) found risk perceptions of a future MI are not congruent with actual clinical risk of MI.

According to the concepts of the HBM, individuals that do not perceive themselves to be at risk for MI are unlikely to make recommended changes to reduce risk factors (Becker et al., 1978). In a U.S. study with 732 people aged 25 to 65 years examining perceived risk factors and perception of MI risk, researchers found respondents were optimistically biased when it came to rating their own risk of MI (Avis, Smith, & McKinlay, 1989). In a study with 490 patients to analyze the actual and perceived 10-year risk of CVD, van der Weijden et al. (2007) found approximately four in five patients with a high risk for CVD were optimistically biased and one in five low-risk patients had incorrect pessimism. Barnhart and colleagues (2009) studied 256 people (n = 159 Hispanic) with at least one CHD risk factor to explore the relationship among individual risk perception, health behaviors, and an index of risk for CHD. Of all participants, 132 were at high risk for CHD and 82 of those were Hispanic (Wright, Barnhart, & Freeman, 2010). Study findings revealed a higher percentage of Hispanics at high risk for CHD underestimated their risk than non-Hispanic Black and non-Hispanic White participants (63% vs. 23.3% vs. 13.7%) (Wright et al., 2010).

According to the developers of the HBM, individuals may be motivated to learn the risk factors for MI and how to control risk factors, if they believe they are susceptible to the illness and the perceived threat will have a potentially serious impact on their lives and the lives of their family (Homko et al., 2008; Nau et al., 2005). Homko et al. (2008) found women were more knowledgeable than men about CVD (65% vs. 62%, $p < .05$), and had higher perceived risk of CVD than men (0.61 vs. 0.15, $p < .01$). In a recent survey on CVD awareness and perceptions, only 29% of Hispanic women correctly cited heart disease and MI as the leading cause of death for women, while 57% reported cancer was the leading cause of death for women ($N = 1,005$) (Christian et al., 2007).

Knowledge of CVD as the foremost cause of mortality among women has increased from 30% in 1997 to 55% in 2005 (Mosca et al., 2006). In a survey of 1,008 women, Mosca et al. (2006) found non-Hispanic White women's awareness of CHD as the leading cause of death nearly twice that of Hispanic women. Mosca and colleagues (2010) found women's knowledge had not significantly increased since the 2006 random-digit-dialing survey. Of the 1,142 adult women in the survey, only 53% of women stated they would call 9-1-1 for their own suspected MI. Similar to Mosca's 2006 study, Christian et al. (2007) found overall women's knowledge of CHD has increased. Hispanic women have a lower knowledge of CHD than both Black and non-Hispanic White women (total $n = 1,005$, $p < .05$) (Christian et al., 2007).

In a study with 2,816 adults aged 35 to 75 years without a history of MI, Gramling and colleagues (2008) tracked participants for 15 years to explore whether

lower (compared to others of the same age and sex) initial self-ratings of CVD risk were associated with lower CVD death rates. Gramling et al. reported men with low perceived risk of CVD was associated with a lower rate of CVD mortality (HR = 0.3, 95% CI, 0.2-0.7), while women did not enjoy such an association (HR = 0.9, 95% CI, 0.5-1.7). The authors hypothesized the reason for the difference among men and women was men were frequently more accurate in their perceived risk for CVD compared to women, but their baseline risk perception data do not support this hypothesis as women had greater accuracy than men (Gramling et al., 2008).

A lack of complete research findings being available on Mexican Americans contribute to the lack of perceived susceptibility and severity to MI. The AHA reports the prevalence of CVD among Mexican Americans is 28.5% in males and 34.5% in females; however, the mortality rate is not reported for CVD as a whole or MI in particular (Lloyd-Jones et al., 2010). The prevalence of CVD and MI are not reported for Hispanic Americans, while the mortality rate is reported (Lloyd-Jones et al., 2010).

Frequently, the MI symptoms experienced are not those expected and the internal tally of perceived susceptibility and, consequently, perceived threat is miscalculated. Movies and media portray a general cognitive idea of the physical symptoms to expect during an MI. In a study of 207 participants in 34 focus groups exploring patient delay in seeking emergency care for MI, Finnegan and colleagues' (2000) first reported theme was an expectation by patients and bystanders that an MI would be dramatic, sharp, and crushing chest pain like that depicted in Hollywood movies. When reality does not meet

one's expectations, there may be further delays in the decision time to seek emergency care (Gärtner et al., 2008). In a study with non-Hispanic Whites and Blacks, only 24% of women and 35% of men described their MI symptoms as somewhat similar or very similar to their prior expectations (Zerwic et al., 2003). Zerwic et al. (2003) found 57% women (n = 99) and 49% men (n = 113) with acute MI described their symptoms as not at all similar to prior expectations.

Often people do not attribute MI symptoms to a cardiac origin and this leads to a delay in decision-making (Finnegan et al., 2000; Gärtner et al., 2008). Lack of perception of the cardiac origin of symptoms may be a psychologically protective means with people failing to perceive MI susceptibility (Avis et al., 1989). McKinley et al. (2004) found MI symptoms perceived as serious were 1.56 times as likely to be associated with a delay time of one hour or less (CI 0.89-2.72) and symptoms perceived as non-cardiac were 0.56 (CI 0.33-0.95, $p < .05$) times as likely to be associated with rapid response time (N = 595).

Conversely, when there is a match between expected MI symptoms and actual MI symptoms, pre-hospital delay may be abbreviated. In a study of 30 men and 30 women that had experienced an MI, King and McGuire (2007) found those MI victims that perceived a match between their expected and actual MI symptoms were 6 times more likely to arrive in the ED $\leq$ 1 hour of MI symptom onset (OR 5.96, p = .01).

Perceived Barriers

Perceived barriers are the estimates of the real and perceived costs of calling EMS during an MI. Ransford et al. (2010) further differentiates barriers as either belief barriers and structural barriers. Belief barriers are the perceived fears, anxieties, and concerns Mexican Americans potentially seeking health care hold, such as the fear of negotiating the complex bureaucracy of a health care system and the stress of seeking health care in light of their immigration status (Ransford et al., 2010). Ransford et al. defines structural barriers as the objective barriers in place in a hospital system such as a lack of translators, the care someone will receive due to their insurance status, or discrimination due to race or ethnicity. Similarly, Carrillo and colleagues (2011) presented their Health Care Access Barriers Model summarizing modifiable health care access barriers into three categories: financial barriers, cognitive barriers, and structural barriers. These barriers all contribute to late ED presentation during an MI and health outcome disparities among Mexican Americans. Barriers may include any combination of the following: calling HCP for permission (Alonzo, 2007), self-treatment (Zerwic et al., 2003), lack of symptom knowledge (Greenlund et al., 2004), language barrier (DuBard & Gizlice, 2008), health insurance status, financial costs, health care access, transportation, (DuBard et al., 2006; Larkey et al., 2001; Warda, 2000), embarrassment if the symptoms are not something serious, not wanting to trouble anyone, family caregiver role (Finnegan et al., 2000), previous health encounters (Warda, 2000), and cultural differences such as a lack of

personalismo (Barron et al., 2004; Warda, 2000) and *confianza* (Larkey et al., 2001; Warda, 2000).

Many individuals experiencing MI symptoms call their HCP for advice or permission to call EMS (Alonzo, 2007; Finnegan et al., 2000). Alonzo (2007) stated 40.9% of symptomatic patients contacted their HCP, while 45.1% called EMS in a study of 1,102 patients that experienced acute coronary syndrome. Alonzo also found that patients who called their HCP first had a median delay time of 6 hours, while those who did not had a median delay time of 1.5 hours from symptom onset. Finnegan and colleagues (2000) summary of focus group findings among 207 participants nationwide outlined the fact that many participants felt they needed to contact HCPs or family members for "permission" to take action during an MI. A literature review of over 73 papers examining the causes of pre-hospital delay during MI showed patients calling their HCP were associated with an increase in median pre-hospital delay from 74 minutes to 120 minutes (Gärtner et al., 2008). Zerwic et al. (2003) found 25% of the delay to treatment-seeking among 212 Black and White individuals that experienced MI, was due to contacting a HCP, self-treatment, and a lack of symptom congruence with expectations. The AHA states the majority of patients are admitted to hospitals 2.5 to 3 hours after MI symptom onset (Lloyd-Jones et al., 2010).

Mexican Americans' response to perceived barriers may include self-treatment instead of, in conjunction with, or before Western medicine. In a study with 212 people that had experienced an MI, Zerwic et al. (2003) found MI victims that attempted self-

treatment of MI symptoms had a significantly longer pre-hospital delay than people that did not try to self-treat ($t = 3.37$, $p < .01$). Ransford et al. (2010) interviewed 12 community leaders and 96 community members to explore health-seeking behavior of Latinos and found participants' response to belief barriers may be self-treatment in the use of herbs, teas, and home remedies rather than trying to access Western health care first. Ransford et al. reported up to half of participants used home remedies and herbs first when they perceived belief barriers to Western medicine. More than half of participants used these perceived natural home remedies and herbs for minor illnesses and just under a quarter of the participants ($N = 108$) used these self-treatment remedies for all illnesses (Ransford et al., 2010). Ransford and colleagues reported that participants turning to alternative medicine viewed it as a rational alternative to the belief and structural barriers and not as fatalism or passivity. In a study of alternative medicine use among 70 Mexican American women with 71% identifying as middle-class, Lopez (2005) found 71% kept *manzanilla* (chamomile) in their home while 80% kept *te de yerbabuena* (peppermint) in the home. In focus group interviews of 90 Arizona Hispanics exploring the cultural norms of health-seeking behaviors, Larkey et al. (2001) reported participants may try self-treatment with over-the-counter remedies and herbs recommended by other people when experiencing symptoms of illness and prior to visiting a HCP.

As previously stated, Mexican Americans have a low knowledge of MI symptom recognition and the need to activate EMS immediately on experiencing MI symptoms

(Greenlund et al., 2004; Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008; McGruder et al., 2008). With a high incidence of diabetes among Mexican Americans, they may be more likely to experience atypical MI symptoms incongruent with their expectations of what an MI would be like (O'Connor et al., 2010). In addition to a knowledge deficit of MI, cultural barriers may also interfere with health care seeking behaviors amid MI symptoms. In a review of culturally competent care of patients with acute chest pain, Sobralske and Katz (2005) explored Mexican Americans cultural response to pain finding one's ability to withstand pain, cope, and work through it were highly valued within the culture. Sobralske and Katz reported the endurance of pain and illness were highly valued signs of strength in the Mexican American culture, especially among men. However, pain was also a motivating factor to seek health care in the Mexican American culture (Sobralske & Katz, 2005). In a study of a rural population (N = 98) that experienced MI, Morgan (2005) found 23% of the variance in decision time was explained by the degree to which symptoms interfered with daily activities (R^2 = .119), degree of anxiety (R^2 = .113), and type of insurance (R^2 = .016). Morgan found 56% of patients who had symptoms that completely prevented normal activities made the decision to call EMS in 30 minutes, compared to 333 minutes for the 14% that reported no interference (F = 8.586, p < .001). Larkey et al. (2001) interviewed 90 Hispanics to explore cultural health-seeking behavior and found the greatest impact in the decision to see the HCP among Hispanics was the seriousness of symptoms (N = 132).

The language barrier experienced by Spanish-speaking Mexican Americans may be a perceived barrier to seeking immediate emergency care during an MI (DuBard et al., 2006; Horwitz et al., 2008; Morales et al., 2002; Wallace & Villa, 2003). In the Joint Commission's Sentinel Event Database, communication issues are the most frequently reported issue in root cause analysis of severe adverse events, and the outcomes are more severe in patients with limited English-speaking capability (Schyve, 2007). Schyve (2007) reported three factors that threaten the health outcomes of patients with limited English proficiency when treated by HCPs proficient in just English: 1) language differences, 2) cultural differences, and 3) low health literacy. In a review of factors affecting Hispanic health care outcomes, Morales et al. (2002) stated a language barrier may lead to a scant medical history, inappropriate medical testing, lack of patient education comprehension, and low patient satisfaction with health care.

The health insurance status and financial costs of health care may be a perceived barrier (DuBard et al., 2006; Warda, 2000) to seeking emergency treatment while experiencing MI symptoms. In a study among 170 Hispanics to explore an instrument measuring immigrant barriers to health care, Keating et al. (2009) reported four factors that explained 54.58% of the variance. Economic resources such as the money to pay for care and transportation to the health care facility explained 15.82% of the variance in scores (Keating et al., 2009). In focus group interviews of 207 participants that had experienced an MI or were at high risk for an MI, Finnegan et al. (2000) found a lack of health care insurance or the cost of health care was not perceived as a barrier to seeking

care in the event of an emergency such as an MI. Ransford et al. (2010) reported 30.7% of Hispanics lack any health care insurance coverage, which is the highest rate among any racial or ethnic group.

Lack of access to health care contributes to pre-hospital delay in Mexican Americans (DuBard et al., 2006; Larkey et al., 2001; Warda, 2000). As previously discussed, lack of health care access may include availability, accessibility, and acceptability (Wallace & Villa, 2003). Keating et al. (2009) studied immigrant health care barriers beyond health care insurance (N = 170) and found issues of convenience and the waiting time entailed in seeking health care explained 8.52% of the variance in seeking health care among Hispanics. A perceived lack of transportation to the hospital can contribute to pre-hospital delay among Mexican Americans experiencing an MI. Living in a city with high-rise buildings and traffic congestion can lead to delays in EMS response time, and living in rural areas far from hospitals can also lead to delays in treatment (MacNaughton, 2008). Finnegan's (2000) focus group participants (N = 207) revealed MI victims would only call EMS if their symptoms were severe; participants were unaware of the advantages of EMS activation, thinking EMS added time to hospital transportation. Participants were most likely to seek out someone to drive them to the hospital or drive themselves rather than calling EMS (Finnegan et al., 2000). In a national study (Rapid Early Action for Coronary Treatment trial conducted in 10 U.S. cities), 5,576 people with chest pain were surveyed to determine if EMS or private transportation was quicker to obtain medical treatment (Hutchings et al., 2004). Hutchings and

colleagues (2004) found private transportation time to the local ED was 35 minutes compared to 39 minutes for EMS (p = .0014). EMS is capable of initiating MI treatment and when this fact is considered, calling 9-1-1 resulted in more rapid definitive care with thrombolytics (EMS median time 75 minutes vs. private transportation 92 minutes, p = .042) after the decision to seek emergency care was made (Hutchings et al., 2004).

Mexican Americans may delay seeking emergency health care during an MI due to their perceived embarrassment if symptoms are not serious, not wanting to trouble others (family, neighbors, HCP), and even their role as the family caregiver (often women) (Finnegan et al., 2000). In a study among 207 focus group participants across the nation, Finnegan et al. (2000) found both men and women named embarrassment if symptoms were not, in fact, an MI as a reason not to activate EMS. Women were more likely than male participants to state not wanting to bother others as a reason for not calling 9-1-1 while experiencing MI symptoms (Finnegan et al., 2000). Women were also more likely than men to cite their responsibilities and function as the family caregiver as a barrier to EMS activation. Mexican Americans with past negative health care encounters will search for advice in someone that reflects the cultural values of *confianza* and *personalisimo* (Larkey et al., 2001). Warda (2000) identified incongruent health experiences contrasting with personal and cultural identity among Mexican Americans (N = 22). Incongruent health care experiences consisted of health care system barriers, discounting, and blaming (Warda, 2000). Health care system barriers included a lack of the following: primary care access, family involvement in health care, respect for cultural

values and practices, interpersonal relationships, and comprehension of economic limits and life situations (Warda, 2000). The lack of primary care access can lead many to seek care in EDs with long wait times and a lack of individualized care, neither of which encourage ED use (Warda, 2000).

Perceived barriers or past negative health encounters may promote use of Western medicine only as a last resort (Larkey et al., 2001). Instead, Mexican Americans may practice self-treatment of symptoms, consultation with family and friends, and traditional or alternative medical treatments sometimes with a *curandero* (spiritual healer) (Larkey et al., 2001; Lopez, 2005). Ransford and colleagues (2010) found that the term *curandero* had a negative connotation as it was associated with ceremonies of spiritual cleansing (often for folk illnesses), or *limpias*, and was seen as sorcery (or *brujeria*). Instead, Ransford et al. reported asking 85 participants about seeking care from a *sanador* or *naturalista*, which are both general terms for "healer" who often uses massage and herbs. About one-third of the 85 participants stated they would use such a healer, one-third stated they would seek such a healer for cost-saving preferring a HCP, and the remaining participants rejected the idea of seeking an alternative medicine healer (Ransford et al., 2010).

Cultural differences may be a perceived barrier to seeking health care during MI symptoms and affect pre-hospital delay. Acknowledgement of family involvement in the Mexican American individual's health is essential (Warda, 2000). Warda (2000) conducted focus group interviews among 22 Mexican Americans to identify concepts of

culturally competent care. Three essential themes regarding the concept of family were identified: family obligation, family support, and family involvement in decision-making (Warda, 2000). Even in the face of acculturation, the importance of family support persevered while family decision-making may have been given up (Warda, 2000). Warda found each participant expected involvement in decisions on family health matters. Instead of calling EMS or going straight to the ED, Mexican Americans may wait and seek advice from family (*familismo)* (Barron et al., 2004; Larkey et al., 2001). Finnegan et al. (2000) found Hispanic women were more likely than men to leave the decision-making of seeking treatment to their family during a suspected MI.

Cultural differences during previous health care encounters among Mexican Americans and HCP may contribute to pre-hospital delay during an MI. Keating and colleagues (2009) explored the factors beyond lack of health care insurance that effect Hispanic immigrant barriers to health care. Cultural identification with the health care team was the primary factor that explained 22.91% of the variance and relates to issues with the health care staff speaking Spanish. Characteristics of the HCP and staff such as having a regular provider, time spent with the patient, and the attitude of the health care team was another factor and accounted for 7.31% of the variance in barriers to health care (Keating et al., 2009).

Among even acculturated Mexican Americans, the use of alternative medicine for a range of illness is quite common and may be a first action to the unfamiliar symptoms of an MI (Lopez, 2005). In a study among 70 Mexican American women (social worker

students) exploring the use of alternative folk medicine among highly assimilated women, Lopez (2005) found increased use of Mexican American folk medicines (herbs, teas, etc.) was negatively correlated with the number of HCP visits (r = -.248, p = .039). Lopez found a greater religiosity among participants was associated with an increased use of folk practitioners such as *curanderos*, *yerberos* (herbalists), and *sobadores* (traditional masseuses) (F = 7.266, p = .001). Prayer was seen as empowering and necessary in the survival of the stress of immigration by about 75% of participants (N = 108) in a recent study focused on health-seeking behavior, but few participants saw prayer as powerful enough alone to cure illness (Ransford et al., 2010).

Perceived Benefits

The perceived benefits of the advised action of calling 9-1-1 during an MI should seem obvious, but emergency situations are not known for rational thoughts. The most immediate and valuable benefit of the desired action is preservation of life, with high quality of life being the most desirable outcome. Premature death (occurring before age 65) due to CVD has been higher among Hispanics (23.5%) than non-Hispanics (16.5%) (Thom et al., 2006). There is a lack of research on the perceived benefits of EMS activation during MI in Mexican Americans.

EMS provides rapid assessment, treatment initiation, pre-hospital electrocardiograms, decreased time to fibrinolysis therapy initiation, and inventions in the event of lethal cardiac rhythms in the first four hours after symptom onset (AHA, 2005; O'Connor et al., 2010). EMS personnel are trained to transfer MI victims to the closest

hospital that is capable of percutaneous coronary intervention (PCI) in the event of a ST-elevation myocardial infarction (STEMI) (O'Connor et al., 2010). Laypersons are frequently unaware of which hospitals are PCI-capable and which perform open heart surgery, while EMS personnel are knowledgeable of local hospital capabilities. Though the U.S. has comprehensive EMS and 9-1-1, Mexico does not have such an advanced system and services may be limited in remote areas. Mexican Americans that have not been living in the U.S. for long may not know about the EMS available or even how to activate 9-1-1 (DuBard et al., 2006).

Emergency dispatch operators can instruct the potential MI victim or bystander calling EMS as to what to do before EMS personnel arrive (O'Connor et al., 2010). Individuals calling EMS may be instructed to administer chewable baby aspirin (160 mg to 325 mg) if and available and not contraindicated by an aspirin allergy or recent gastrointestinal bleed (O'Connor et al., 2010).

Finnegan and colleagues (2000) found the majority of 207 focus group participants were aware that seeking medical treatment during a suspected MI could lead to avoiding sudden death. Only a fraction of the same participants were aware of the life-saving benefits of thrombolytic therapy, benefits of rapid action and cardiac preservation, or the capabilities of EMS in stabilization of MI victims (Finnegan et al., 2000).

Evaluation of patients with a possible MI occurs rapidly in the ED with set protocols in place to expedite the STEMI reperfusion protocol. For patients with a STEMI, the goal for reperfusion is 30 minutes from ED arrival to fibrinolytic drug or 90

minutes from ED arrival to PCI (O'Connor et al., 2010). Early reperfusion by one of these means will reduce patient mortality, and fibrinolytic therapy within an hour of symptom onset has been shown to reduce mortality by up to 47% (O'Connor et al., 2010). A decrease in pre-hospital delay could decrease mortality by effectively achieving early reperfusion.

Self-Efficacy

Self-efficacy is defined as the confidence in one's knowledge and actions. Spanish-speakers with low SES are at risk for a lack of MI knowledge and also a lack of self-efficacy when it comes to health risk factors (DuBard et al., 2006). Hispanics have been reported to be less confident than non-Hispanic Whites in their abilities to recognize an MI (Barnhart, Cohen, Kramer, Wilkins, & Wylie-Rosett, 2005). Barnhart et al. (2005) found 63.1% of those with a college degree had confidence in the recognition of an MI compared to 21.5% of those without a degree.

Even Mexican Americans with health care access and a primary HCP may lack knowledge about what to ask about cardiac health and MI symptoms. Hispanic women are less likely to feel comfortable discussing CHD with HCPs compared to Black and non-Hispanic White women ($p < .05$) (Christian et al., 2007). In a study among 1,005 women, Christian et al. (2007) stated about a third of the 125 Hispanic women surveyed had discussed CHD with their HCPs compared to almost half of Whites and over half of Black women. Christian et al. found 17% of Hispanic women felt uninformed about CHD compared to only 6% ($p < .05$) of Black women.

According to Mexican tradition, illness is classified as either natural or unnatural as stated by Barron and colleagues (2004) in a review of Mexican American acculturation and adherence. Natural illnesses are caused by fate or God's will, while unnatural illnesses are caused by evil directed at a person (i.e. *mal de ojo*) (Barron et al., 2004). The belief that faith and not medical management are necessary for recovery from illness stems from Roman Catholicism, the predominant Mexican American religion (Barron et al., 2004).

The literature reports varying degrees of fatalism in health outcomes (Larkey et al., 2001; Warda, 2000). Christian et al. (2007) found 22% of Hispanic women agreed there was nothing they could do to prevent heart disease compared with 11% of non-Hispanic White women. Mosca et al. (2006) stated the belief that health is determined by a higher power was a barrier to lowering CVD risk factors for more Hispanic and non-Hispanic Black women (n = 443) compared to non-Hispanic White women (n = 565). These findings suggest belief in a higher power and lack of self-efficacy may be heart health barriers (Mosca et al., 2006).

Through work with focus groups, Larkey et al. (2001) discovered faith in God and *fatalismo* were associated with Mexican Americans seeking health care (N = 90). Though the literature states Mexican Americans tend to delay seeking health care due to fear and an acceptance of God's will, Larkey et al. found another perspective. "And rather than providing a substitute to visiting the doctor, faith in God seems to support seeking health care, mediated by a search for a doctor one can trust" (Larkey et al., 2001, p. 76). Warda

(2000) found little evidence of fatalism in Mexican Americans; a relationship with God and His power existed along with an individualized sense of power over one's health.

Individual Behaviors: Learning, Action, and Cues to Action

Individual behaviors are the health outcomes that result from the complex and unique admixture of individual beliefs and cues to action (Champion & Skinner, 2008). Individual behaviors include the desired actions and outcomes of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction: learning the signs and symptoms of an MI, learning when to call 9-1-1, the act of calling 9-1-1 for MI symptoms, and the cues to action that trigger the health outcomes.

Mexican Americans may be optimally receptive to learning about MI once the perceived susceptibility, severity, and perceived threat of MI are realized with accurate education (Larkey et al., 2001). Barriers to initiation of EMS can be reduced with education in English and Spanish from HCPs and media. Positive health encounters with HCPs close in relationship, gender, and ethnicity may overcome previous negative health encounters experienced (Larkey et al., 2001). Increasing MI symptom recognition (CDC, 2008), learning CVD risk factors (Lloyd-Jones et al., 2010), and awareness of CVD as the leading cause of death (Mosca et al., 2006) can help decrease pre-hospital delay during MI in Mexican Americans.

Even Mexican Americans recognizing MI symptoms may not respond with EMS activation. Every racial and ethnic group scored higher than Hispanics in their response to call EMS in the 2001 BRFSS (88.5% $\pm$ 2.3 versus 82.5% $\pm$ 1.4) (Greenlund et al., 2004).

More recently, 80.4% of Hispanic men and 87.3% of women stated their first action in an MI would be to call EMS (Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008).

Delay in MI treatment remains a national and international health care problem with decision-making consuming the majority of pre-hospital delay. Morgan (2005) reported a median decision time of 93 minutes for men and 108 minutes for women in a study done in the rural northeast (n = 98). Median delay times of non-Hispanic Whites have been comparable to those of non-Whites or significantly lower with median delay times as low as two hours (Alonzo, 2007; Zerwic et al., 2003). DeVon et al. (2010) revealed only 20.3% of patients arrived in the ED in two hours or less from symptom onset. McKinley et al. (2004) found pre-hospital delay times of one hour or less were as follows: 23% in the U.S., 18% in Korea, 15% in England, and 8% in Japan.

Cues to action may be internal or external triggers that often unconsciously propel individuals to do the desired behavior (Champion & Skinner, 2008; Janz & Becker, 1984). Internal cues to action may include a "little voice" or actual MI symptoms (Becker et al., 1977). External cues to action include family or friends that have had an MI, a spouse having an MI, public communications, communications during health encounters, and interpersonal communications (Becker et al., 1977; Champion & Skinner, 2008).

The HBM is a sociobehavioral theory developed based on observations and research with non-Hispanic Whites and Europeans (Larkey et al., 2001). The HBM lacks accountability in issues affecting the health beliefs and attitudes of Mexican Americans including acculturation, past health experiences, and health care access. The Modified

Health Belief Model for Use in Mexican Americans with Myocardial Infarction in Figure 1 attempts to account for issues influencing MI recognition and treatment-seeking behavior in the Mexican American population.

Based on the HBM, the model illustrates the influence of influencing factors in the MI decision-making process among Mexican Americans. In this revised model, influencing factors influence the individual's beliefs. The beliefs of perceived susceptibility and perceived severity comprise the individual's perceived threat to illness. The individual's beliefs affect the probability that he/she will learn the signs and symptoms of MI and influence the desired action of EMS activation during an MI (see Table 1).

Summary

This review of the literature shows evidence of the extensive quantitative research that has been completed, yet there has been no change in the pre-hospital delay. Much of the quantitative research completed has been done without a substantial number of Mexican Americans or even Hispanics. This qualitative study will facilitate the exploration of the MI experience among Mexican Americans and begin to fill the knowledge gap in research. Research on influencing factors such as acculturation may lend depth to our understanding of motivation for treatment-seeking behaviors among different generations of Mexican Americans (first, second, etc.). The possible effect(s) of pre-existing co-morbid conditions in Mexican Americans may further advance our knowledge, especially in regards to the effects of prior health encounters. This review

supported the use of the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction for utilization in research examining the initiation of EMS for MI. Evidence exclusive to Mexican Americans is scarce (DuBard et al., 2006). Cues to action are an understudied area of the model likely due to the lack of conscientious behavior. Investigations examining cues to action would direct interventions to improve Mexican Americans' early EMS activation.

When actual MI symptoms are incongruent with prior expectations, delay to treatment increases by hours, regardless of gender, race, or ethnicity (Finnegan et al., 2000; Zerwic et al., 2003). Delaying factors are modifiable with education (Tullmann et al., 2007). Public education is needed to improve time to treatment, and HCP cannot assume patients know MI symptoms and when to activate EMS (Tullmann et al., 2007).

To address health care disparities, HCPs need to improve cultural competence for people of all ages, racial, ethnic, cultural, and SES groups. Hospitals have the technology to save lives and cardiac function in victims suffering cardiac events (Lloyd-Jones et al., 2010). Public knowledge of MI symptoms and multilingual education on the importance of immediate EMS access must be strengthened to improve treatment outcomes and decrease cardiac health disparities among Mexican Americans. Education efforts among Mexican American adults of low SES and less than a high school education would make the largest impact on layperson knowledge (DuBard et al., 2006).

Researchers need to examine the facets of decision-making delay among Mexican Americans. The vast majority of research in this area examines non-Hispanic White and

Black populations, yet Hispanics are the largest minority population in the U.S. representing 16.3% of the population (U.S. Census Bureau, 2011). Mexican Americans comprise 88% of the Hispanic population in Texas (37% of state population) (Pew Hispanic Center, 2009). Long-term outcome measurement, such as reduction in MI symptom onset time to arrival at an ED and an increase in the number of individuals with preserved cardiac function when discharged home post- MI should be included as outcome measures in this research. A *Healthy People 2010* objective was to 'decrease disparity in MI knowledge and increase population knowledge of MI symptoms', so laypersons can rapidly identify possible MI symptoms, and rapidly act in those vital moments to activate EMS for the initiation of evidence-based lifesaving interventions.

Chapter 3: Methods

The purpose of this chapter is to outline the research methodology used to study the perceived benefits and barriers to seeking cardiac emergency care during myocardial infarction (MI) among Mexican Americans that have experienced their first MI. This chapter describes the qualitative descriptive study design, sample population, setting and procedures for recruitment, data collection, data analysis, and protection of human subjects.

Design

For this study a qualitative descriptive approach was used to obtain a naturalistic depiction of Mexican Americans' perceived barriers and benefits to seeking cardiac emergency care.

Qualitative descriptive is an appropriate choice to answer the research question, and the design allows the use of a guiding theory or model (but does not require it) (Phillips, 2006; Sandelowski, 2000; Sandelowski, 2010). Interview data was collected as the foci of this qualitative study examining Mexican Americans' perceived barriers and benefits to initiating emergency care during MI. I conducted and audio-recorded face-to-face semi-structured interviews. A qualitative descriptive methodology (Sandelowski, 2000) was employed, and the method guiding the analysis of the verbatim naturalistic participant transcripts was conventional content analysis as described by Hsieh and Shannon (2005).

Sampling

Study Population

A convenience sample of 12 community dwelling Mexican Americans that have had one MI and who were under the care of a cardiologist in the Austin, Texas metropolitan area was recruited through three cardiology clinics. Mexican Americans comprise 63% of the United States' (U.S.) Hispanic population (U.S. Census Bureau, 2011). In Texas, Mexican Americans comprise 88% of the Hispanic population (37% of state population) (Pew Hispanic Center, 2009). Though Hispanic Americans are a very diverse group with distinct health disparities, they are often not differentiated by subgroup in research studies in which they are included and are often labeled as "other" (DuBard, Garrett, & Gizlice, 2006; Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008). Focusing this qualitative study on Mexican Americans will allow focus on the perceptions of this population with a disproportion of cardiac risk factors.

Mexican Americans have multiple influencing factors (see Figure 1) that may affect their perceived benefits and barriers to MI emergency treatment. Forty percent of Mexican Americans speak primarily Spanish (Pew Hispanic Center, 2004), and 25.8% of Mexican Americans live in linguistically isolated households wherein no adults speak English "very well" (Smedley, Stith, & Nelson, 2003). Many Mexican Americans work in jobs which are blue collar, manual labor, service industry, without medical benefits, have a low annual household income, and live without health insurance benefits (Smedley et al., 2003; U.S. Census Bureau, 2006). The 2003 to 2005 Behavioral Risk

Factor Surveillance System (BRFSS) stated 60.2% to 65.5% of Hispanic annual household incomes were under $35,000 (Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008). DuBard and Gizlice (2008) reported 36.2% of Spanish-speaking Hispanics earn an annual income less than $15,000 compared to 15.3% of English-speaking Hispanics.

Lack of health insurance differs among Hispanic subgroups and primary language spoken from 14.7% to 38.6% (Weinick, Jacobs, Stone, Oretega, & Burstin, 2004). Weinick and colleagues (2004) reported 32.2% of Mexican Americans do not have public (22.2%) or private insurance (45.6%). DuBard and Gizlice (2008) found 55.4% of Hispanic Spanish-speakers (total n = 17,827) lack health insurance compared to 23.3% of Hispanic English-speakers (total n = 27,249). Estimations are 35% of Hispanics are uninsured in contrast to 17.5% of the general U.S. population (Smedley, Stith, & Nelson, 2003; Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008). *Healthy People 2010* reports 40% of Mexican Americans are uninsured (Agency for Healthcare Research and Quality & Health Resources and Services Administration, n.d.). Texas Hispanics without health insurance number 38%, while 27% of native-born Hispanics and 62% of foreign-born Hispanics are uninsured (Pew Hispanic Center, 2009).

The study was reviewed by the University of Texas at Austin Institutional Review Board (IRB) and approved. The inclusion criteria for the study were:

- Mexican American adults age $\geq$ 35 years who have experienced their first and only MI in the previous 24 months.

- Health care provider's diagnosis of MI in the previous 24 months.
- Potential participants had to be community living and speak English effectively enough to communicate thoughts, explain their general understanding of the study, and provide consent.
- Each participant had to express willingness to participate in the research study and want to speak on the topic.

Due to recruiting challenges an IRB addendum was submitted with the annual IRB renewal to expand recruiting to Mexican American adults age $\geq$ 35 years who have experienced their first MI (instead of first and only) in the previous 24 months. Data analysis revealed saturation at 12 participants and recruiting was discontinued.

Individuals with cognitive impairment were excluded from the study, as their recollection of events and thoughts from the MI time period may have been poor. Pregnant women were excluded because of the potential unnecessary stress to pregnant mothers and the inclusion of pregnant women was not necessary in the study to gain perspective on the research questions. Individuals at end of life or awaiting an organ transplant potentially have a very different perspective on life than participants not known to be near the end of life, therefore they were excluded from the study.

In summary, the exclusion criteria were as follows:

- cognitive impairment
- pregnancy
- at end of life (less than six months to live)

- anyone awaiting an organ transplant

Sample Size

The exact number of research participants required to reach saturation was not known until data collection was complete (Marshall, 1996; Small, 2009). The projected sample size was twenty adult Mexican Americans that have experienced their first MI in the 24 months prior to study enrollment. Data saturation was achieved with 12 participants, so recruiting ceased. The intention of the study was to identify perceived benefits and barriers to emergency care activation during an MI in Mexican American adults using a qualitative descriptive design.

Procedures

Recruitment

Initially, permission was obtained from two cardiology clinics to recruit participants. A contact nurse that interacted with patients was established at each clinic. The first three participants were recruited from the same clinic in the first two months and then months passed with no potential participants to screen. An IRB addendum was completed and approved by the University of Austin at Texas to include permission to recruit from the community and to expand the study population to include Mexican American adults who had experienced their first MI in the past 24 months (expanded from first AND only MI).

I expanded recruiting attempts to the community. Multiple Catholic churches, community centers, non-cardiology clinics, and community health fairs were contacted

with recruitment flyers posted in recruiting efforts, but without another potential participant yielded from this effort. I also expanded recruitment to an additional cardiology clinic.

In summary, participants were recruited through three Austin area cardiology clinics from March 2012 to February 2013: Cardio Texas, Texas Heart and Vascular, P.A., and Austin Heart. Potential research participants were identified on outpatient follow-up by nurses and providers working in the cardiac clinics, and individuals were asked to provide contact information on the recruitment flyer if they were interested in study participation. The cardiology clinics that were used for recruitment in this study serve a large Mexican American population and permission was obtained to recruit participants that meet the study inclusion criteria (See Appendix A for letters of support).

Information flyers about the study were disseminated among cardiology staff, Participating providers and nurses at each site were supplied with information flyers to personally hand to clients that meet inclusion criteria. If the client was interested in participating, the flyer instructed the patient to write their contact information on the flyer and give the flyer back to the provider. I contacted a specific contact person at two clinics each week and one of two research nurses I was working with at an Austin Heart site monthly to determine if there were flyers to retrieve at any of the recruiting sites. Austin Heart became a recruiting site in August 2012 to expand recruiting.

All flyers stated the purpose, inclusion criteria, and a contact number and email address for the Principle Investigator (see Appendix C for the recruitment flyer). Upon

receipt of the potential participant's information, I made contact with the potential participant by telephone. This phone conversation included explaining the study and screening the potential participant's qualification for inclusion in the study.

The screening procedure was as follows:

1. To screen for cognition each participant was asked, "Has a doctor ever said you have problems with your memory?" If yes, "what did the doctor tell you?" If the health care provider told the potential participant they have memory problems beyond the aging process, the cognitive impairment screening is positive.
2. Over the course of the telephone call, each potential participant's ability to speak English was assessed and verified.
3. I obtained verbal consent for each individual to participate in the study over the phone.
4. If the potential participant gave verbal consent, an appointment was scheduled for a mutually convenient time and location to complete the interview and collect demographic information.
5. At the time of the appointment, I obtained written consent to participate in the study.
6. Callers who did not meet the eligibility requirements were thanked for their time.

Three participants were excluded from the study: one because he was not of Mexican American descent and two were excluded because they had more than one MI in the past 24 months. These exclusions were prior to the IRB addendum to extend recruiting to the first MI in the past 24 months.

Data Collection

I used semi-structured, open-ended interview questions along with probing questions to elicit narrative responses from participants (See Appendix D for a list of questions). The central interview questions asked, "Tell me about your heart attack. What was your heart attack like for you? How did you come to the hospital?"

The questions were devised to explore why people would and would not go to the emergency department in the instance of possible MI symptoms (Larkey et al., 2001). The main issues were addressed in the same order for each participant; however, specific questions may or may not have been used given the participant's responses. As new topics and issues arose, I used follow-up probes depending on the answers to the main questions.

The central research questions were the focus of the interview, though there were numerous open-ended questions that were asked during each interview to illicit more information as the participant spoke to the research question. After the participant told their story, I asked their thoughts about calling 9-1-1 and initiating emergency medical services (EMS) as most never mentioned this service until I asked. I purposefully asked each of my follow-up questions in the same order if the participant did not touch on that

area already or did not address the topic completely (i.e. perceived barriers to initiating EMS). Once a clear picture of the participant's pre-hospital experience had been obtained, I asked the participant what they would do if they experienced these symptoms again. I then asked what the participant would do if there was a friend or family member at the home having the same symptoms they experienced.

I offered each participant the choice of conducting the interview in either the participant's home or a mutually agreed public setting. Two participants chose to complete the interview at their place of work during their lunch break while the remaining ten were interviewed in their home at a mutually convenient time. Interviews were conducted individually with each participant with the exception of one interview in which the participant's wife participated relaying what happened while the participant was unconscious from a dental procedure. Interviews lasted approximately one hour and ranged from 30 minutes to 87 minutes. After each interview, the interview questions were reevaluated for appropriateness in light of new data collected. No revisions were deemed necessary to either the questions or the order in which they were asked to the participants.

Each interview was audio taped using two digital recording devices and with the full knowledge of all the participants. The first recorder was between the participant and I. The second recorder had a small microphone with a clip that the participant clipped onto their shirt to enhance the audio recording. Field notes were written immediately after the interview. Some of these field notes had started with the telephone interview if the participant was difficult to reach or said something beyond responding to the telephone

screening questions. For example, one participant had just been to her cardiologist who told her to take a couple of months off from substitute teaching school children during the height of the influenza season as she recovered from heart failure and her MI. I obtained permission from each participant to call them within two weeks of the interview with any follow-up questions. Two of the men were contacted after the interview by telephone to ask some follow-up questions. The information obtained was added to the respective field notes of each participant.

The interviews were transcribed using Microsoft Word and Dragon NaturallySpeaking 11.5 (Nuance Communications, Inc., Burlington, Massachusetts) software (for five interviews). The remaining seven interviews were transcribed verbatim by a professional non-certified transcribing service. Interviews were transcribed verbatim in a naturalistic style for analysis. Naturalistic transcription contains every participant utterance (Oliver, Serovich, & Mason, 2005).

Instruments.

Demographic data sheet.

Demographic information was collected: age, gender, socioeconomic status, language spoken at home, language spoken at work, generational status (in U.S.), years living in U.S., insurance status, and time since MI (see Appendix E). I also inquired about participants' past medical history by asking if a doctor had told the participant they have other illnesses, and, if so, I asked the participant to list those illnesses. Socioeconomic status was assessed by asking about the years of participant education and the relative

ability to meet basic living needs. The demographic questions were collected at the completion of the audio recorded interview. As I asked the sociodemographic questions, the audio recorders were still recording as I wrote the participant responses to each question on a separate demographic data sheet for each participant.

Data Analysis

I transcribed the verbatim texts of each of the first five interviews, while a professional transcriptionist transcribed the remaining seven interviews. I checked all transcribed interviews for accuracy with the audio recordings and made corrections. The transcriptions were checked for accuracy by a second qualitative researcher that randomly chose three transcriptions to review by listening to the audio recordings and reading text. The qualitative researcher checked more than 10% of the transcriptions in this way. My goal was concurrence of the naturalistic transcriptions and the independent check for accuracy.

I used qualitative content analysis to guide the analysis of the verbatim participant transcripts. This method is recommended for a comprehensive and organized summary of qualitative descriptive research with the least amount of data interpretation (Sandelowski, 2000; Small, 2009). The precise analysis method used is conventional content analysis, wherein specific codes were directly derived from the data instead of *a priori* categories (Hsieh & Shannon, 2005).

The transcripts were formatted in Microsoft Word documents with numbered pages, line numbers, and a column for coding. In this inductive development of

categories, I read the printed data transcripts several times to familiarize myself with what the participants said. Line-by-line coding of all text was completed by hand. In order to stay close to participants' words and limit interpretation, keywords and phrases stated by the participants were used (Hsieh & Shannon, 2005). Meaning units, which may vary in length from phrases to a sentence or several sentences depending on the text (Saldaña, 2009), were identified and labeled with the participant, page, and line numbers. Several words representing the meaning unit in the words of the participant were written in the column of the transcript. For example, if the participant used the words "short of breath," these were the words used to title the meaning unit, rather than the medical term "dyspnea." The original transcripts were used to confirm the meaning unit in context. Meaning units were reviewed, discussed with a second qualitative researcher, and consensus on meanings was reached by both the second qualitative researcher and I as advised by Saldaña (2009).

Coded meaning units were then color coded with colored pencils to represent conceptually linked subcategories. The subcategories were organized into a Microsoft Word document and grouped to form categories. For some subcategories, it was necessary to form meaning unit clusters depending on the statements of the participants. Direct participant quotations were used to illustrate each section of the analysis in the Word document and facilitated identification of similar statements from participants. The initial categories and subcategories emerged from the data with no *a priori* categories (Hsieh & Shannon, 2005). Though the theoretical model (Figure 1) hypothesized

potential concept relationships, the data emerged independently of the model. Categories were sorted into meaningful and conceptually distinct clusters that form a theme. The subcategories, categories, and overall theme were discussed thoroughly by the researcher and the second researcher familiar with MI research until a consensus was reached (Saldaña, 2009). The theme and categories were used to organize study findings and understand the perceived benefits and barriers to seeking cardiac emergency care during an acute MI (Saldaña, 2009).

A notebook was kept for writing memos as ideas came to me throughout the interview, transcription, analysis, and writing up results process. I also kept a poster board with sticky sheets with notes for the sole purpose of moving them around for the most comprehensive presentation of the theme, categories, subcategories, and meaning unit clusters as I completed each interview and analyzed data concurrently. I referred back to each of these to make sure I addressed pertinent points while writing up the results and final chapter.

Trustworthiness

Data validity and trustworthiness were addressed through Guba and Lincoln's (1982) standards of credibility, transferability, dependability, and confirmability. Credibility (internal validity) was achieved through peer debriefing with faculty and following the content analysis methods described (Guba & Lincoln, 1982). Purposeful sampling to ensure a wide range of responses (within the inclusion criteria) and thick description facilitated a vivid experience for the reader and realistic judgment of

transferability (Guba & Lincoln, 1982). The dependability of the data was ensured through the use of a detailed audit trail (Guba & Lincoln, 1982; Miles & Huberman, 1994; Rogers & Cowles, 1993) and memos (Miles & Huberman, 1994; Rogers & Cowles, 1993) which described the steps in the methodological process and decision points at each stage (Guba & Lincoln, 1982). Data confirmability was enhanced by reducing personal biases through the researcher discussing data with faculty. Through discussion with faculty, it was confirmed findings were from the interview data.

Protection of Human Subjects

Risk to the Subjects

Procedures for the protection of human subjects as outlined by The University of Texas at Austin IRB and the Collaborative Institutional Training Initiative (Collaborative Institutional Training Initiative, 2009) were followed throughout the study. After IRB approval from the university and local study approval from the participating clinic sites where potential participants were recruited, I began participant recruitment. The study was explained to each potential participant during the agreed upon one-time appointment. All potential participant questions were answered and the voluntary nature of the study was emphasized in speaking with potential participants. Potential participants were advised that their participation status would not influence the care they receive at their respective cardiology clinics. All participants completed informed consent prior to gathering any data. Each participant received a copy of the informed consent they signed.

Since English was not the primary language for all the participants, extra time was spent ensuring that participants whose primary language was Spanish fully understood the study purpose and procedures and the voluntary nature of their participation. Each potential participant was able to generally explain the study purpose and procedures to me in English, and participants had sufficient English-speaking ability to participate in the study. The population targeted for the study was not identified as a vulnerable population (institutionalized individuals, pregnant women, etc.), but one participant was greater than 65 years of age. A question was asked during the initial telephone conversation to assess cognitive function. No potential participants were excluded from participation in the study due to cognitive impairment.

Sources of Data

I collected all data for this study. The main source of research data is the narrative responses of participants during the one-on-one interviews. I used two audio recording devices (primary and back-up) to ensure accuracy and completeness of participant narratives. The interviews rely on the self-report of each participant, so participant interest in talking about the topic was vital. Demographic data was gathered at the end of the interview and also relied on the self-report of participants.

Participant names and contact information for the initial telephone call and any follow-up calls were kept in a folder in a locked file cabinet separate from the data (interview and demographic information). Only I had access to the locked cabinet, and the data was only obtained for purposes of the study to contact each participant.

Participant confidentiality was ensured through the use of an identification number assigned to represent each participant's data. Individual folders linking participant names and identification numbers were kept locked in a file cabinet separate from the data and accessed only for purposes of the study. Completed informed consents were kept locked in a file cabinet separate from the data.

Potential Risks

There were no expected physical risks for participants in this study. A possible anticipated risk was the emotional distress of reliving a stressful period of life in which the participant survived an MI, an event many people do not survive. A few participants were overcome with emotion during the interview, necessitating the need to pause and regain composure. I am an experienced advanced practice nurse with over 15 years of experience with this population and I took every precaution to avoid overly stressing the participants.

Potential Benefits of the Study

The potential benefits to the participant included an opportunity for catharsis and to potentially learn from the retelling of the events surrounding their MI experience. It is believed a number of participants that wanted to speak about their MI may have benefited psychologically from telling their story to someone that understood what they have been through and that is truly interested in what the participant had to say. Participants may have found the self-reflection of telling their story valuable and this may help them to react quickly if they or someone else they know has MI symptoms in the future.

Researchers and health care providers do not know the perceptions of Mexican Americans having an MI. Very little is known about the perceived barriers and benefits of Mexican Americans regarding the initiation of emergency care during an MI. This study facilitated the interview of Mexican Americans that have experienced an MI in the last 24 months to gather data on their perceptions. The information obtained during this study directly led to the support of concepts in the Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction (see Figure 1) which health care providers may use to understand the concepts that affect their patients' actions during an MI. This model may help health care providers have vital discussions with patients at risk for an MI in which providers tell patients when they must activate EMS. The information obtained in this study may also sensitize both health care providers and researchers to the aspects of the Mexican American culture which may affect EMS activation. Findings of the study will be used to build on the knowledge about MI in Mexican Americans for future research, including the development of questionnaires and intervention studies.

Decreasing the pre-hospital delay in Mexican Americans would greatly benefit society by decreasing premature mortality, increasing quality of life, and decreasing health care costs. With improved outcomes post-MI, society may benefit from the decreased mortality from the potential complications of MI such as heart failure. Victims of MI that received timely treatment and were able to avoid the long-term complications of an MI will often be able to continue working and sustaining the quality of life they had previous to an MI. Decreased morbidity and mortality from MI will decrease health care

costs to the individual and society, while the MI victims may be able to continue working and previous activities.

Summary

There has been little research among Mexican Americans that have experienced an MI. Mexican Americans have high morbidity and mortality due to MI and have a disproportionately high number of cardiac risk factors. This study sought to examine and understand the perceptions of the benefits and barriers to the initiation of cardiac emergency care among 12 Mexican Americans that have experienced an MI in the last 24 months. The procedures for recruitment and protection of subjects are described. A qualitative descriptive methodology with a semi-structured interview format was used to interview qualified participants until data saturation was achieved. Verbatim naturalistic transcripts were analyzed using a conventional content analysis method to derive a theme, categories, and subcategories from transcribed interview data. Data analysis revealed the perceived benefits and barriers of Mexican Americans that reflected back to the time they experienced an MI. With this new understanding, the goal is to make the culturally appropriate changes in provider-patient interactions and education and decrease pre-hospital delay. The potential societal benefits of this study include decreasing the pre-hospital delay in Mexican Americans, decreasing premature mortality, increasing quality of life, and decreasing health care costs to both individuals and the nation.

Chapter 4: Results

This chapter will present the results of the research study. This chapter describes the demographic characteristics of the sample and the findings related to the overall theme, categories, and subcategories. Findings are organized by category with related subcategory findings presented under each category.

The purpose of this study was to describe perceived benefits and barriers to seeking cardiac emergency care including emergency medical services (EMS) activation at the onset of myocardial infarction (MI) symptoms in Mexican American adults. This was accomplished by using conventional content analysis to explore narratives obtained from 12 Mexican American adults who experienced a recent MI. The aim of this study was to describe the experiences of Mexican American adults in seeking emergency care (including EMS activation) at the onset of MI symptoms. The research question addressed in this study was "What are the factors that affect Mexican American adults' actions at the onset of MI symptoms?" The 12 Mexican American men and women in this study voluntarily shared their honest thoughts about the events and feelings surrounding their MI event.

Individual interviews were completed with 12 participants volunteering to tell me about their MI experience. Participants were candid about their thoughts and feelings before, during, and after their MI. Each participant had had time to reflect on what had happened and this reflection lent insight into factors that influenced their thoughts and actions during the time leading up to their diagnosis of MI by a health care provider. The

names of all participants and family have been changed to protect the participants identity.

Demographics of the Sample

A description of the sample is presented in Table 2. In summary, research participants were adult men and women of Mexican American descent diagnosed with their first MI in the last two years. The participants consisted of eight men and four women, with an age range of 44 to 67 years, and a mean age of 54.9 years. Eleven participants were born and lived in the United States (U.S.) their whole life. The participant born in Mexico immigrated to the U.S. at five years of age. Eight participants had private insurance, while the remaining four participants had health coverage through the public assistance. A family member had experienced an MI among 75% (n = 9) of participants and 58% (n = 7) of the sample reported their father had experienced an MI (Table 2). Though nine participants were employed full-time, four of these also had an additional job before and after their MI. Data was collected on the medications each participant was taking at the time of the interview. There were no unexpected medications given the participants' health status.

Based on the demographics of the group, the typical research participant was a man in his mid to late 50s, married, and a high school graduate. He was a third generation Mexican American diagnosed with hypertension and hyperlipidemia, whose father experienced an MI. According to the sociodemographics collected, the typical participant

Table 2.

Sample Demographics

Sample Characteristics	*N* = 12	*n* (%)
Gender		
Male		8 (67)
Female		4 (33)
Marital status		
Married		9 (75)
Single		1 (8)
Widowed		2 (17)
Number of occupants in the home		
2		5 (42)
3		2 (17)
4		3 (25)
5		--
6		2 (17)
Employment status at time of MI		
Full-time		9 (75)
Part-time		2 (17)
Disabled		1 (8)
Employment status post-MI		
Full-time		7 (58)
Part-time		3 (25)
Disabled		2 (17)
Socioeconomic status		
Not enough money to buy things I need		2 (17)
Enough money to buy things I need and medications		4 (33)
Enough money to buy things I need, plus a few extras		6 (50)
I have plenty of money		--
Insurance		
Private		8 (67)
Public assistance through county or city		4 (33)
Highest level education		
Elementary school		1 (8)
Middle school		3 (25)
High school		1 (8)
Some college		5 (42)
4-year college		2 (17)

Table 2. (continued)

Generation status	
First generation	1 (8)
Second generation	3 (25)
Third generation	5 (42)
Fourth generation	2 (17)
Fifth generation	1 (8)
Language spoken at home	
English	8 (67)
English and Spanish	2 (17)
Spanish	2 (17)
Language spoken at work	
English	9 (75)
English and Spanish	3 (25)
Spanish	--
Family member with MI	
Yes	9 (75)
Father	7 (58)
One family member	3 (25)
Multiple family members	6 (50)
No	3 (25)
Co-morbidities	
Bilateral above knee amputations	1 (8)
Anxiety	2 (17)
Arthritis	1 (8)
Back pain	2 (17)
Carpal tunnel	1 (8)
Cirrhosis	1 (8)
Colon cancer	1 (8)
Diabetes	4 (33)
Hyperlipidemia	9 (75)
Hypertension	8 (67)
Thyroid disease	2 (17)
See for health related issues	
General practitioner/primary care physician	5 (42)
Family care physician	5 (42)
Cardiologist	6 (50)
Acupuncture	2 (17)
Chiropractor	2 (17)
Physical therapist	1 (8)

Table 2. (continued)

Cigarette smoking	
Yes	7 (58)
Currently	3 (25)
Quit	4 (33)
No	5 (42)

Note. In some cases totals do not equal 100% as values have been rounded to the closest whole number. Diabetes 4 + 1 pre-diabetic.

had private health insurance and was employed full-time both before and after the heart attack with enough money for his needs and a few extras in life. Though it wasn't an interview question, 58% (n = 7) of the sample had a history of smoking (four had quit and three continued to smoke at the time of the interview).

Theme

Overview Subcategories, Categories, Overall Theme

Conventional content analysis of the 12 interviews exposed the overall theme of **degree of perceived threat leads to action**. The overall theme was made up of five categories that correspond with the individual beliefs concept of the conceptual model: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and learned behavior (see Table 3). Each of these subcategories and the concepts within are closely linked. A majority of the participants' narratives fit into the category of perceived susceptibility. Perceived susceptibility was closely linked to perceived severity throughout the narratives. In fact, it appeared that perceived susceptibility and perceived severity potentiated each other and resulted in an additional concept of perceived threat. This is depicted by the following formula:

Perceived Susceptibility + Perceived Severity = Perceived Threat or 'readiness to take action.'

Only four of the 12 participants spoke explicitly about how their perceived threat lead to action; however, the theme was derived from examination of the relationships between individual beliefs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and learned behaviors) portrayed in the participant narratives. It is a complex interaction of the categories of perceived susceptibility and perceived severity and can be a huge belief concept in propelling someone to act.

Perceived Benefits – Perceived Barriers = Possibility of personal ability to reduce threat

Table 3.

Degree of Perceived Threat Leads to Action: Categories

Degree of Perceived Threat Leads to Action
Perceived Susceptibility
Perceived Severity
Perceived Barriers
Perceived Benefits
Learned Behavior

Category: Perceived Susceptibility

Participants spoke about their perceived susceptibility for at least half of the total interview and its high importance to their thought process was apparent as a result.

Perceived susceptibility is one's perception of likelihood or risk of MI (Becker, Maiman et al., 1977; Janz & Becker, 1984; Rosenstock et al., 1988). Given the time participants dedicated to this theme in their narratives, it is not surprising that perceived susceptibility is the largest category and encompasses three subcategories: a) heart health, b) risk factors, c) and MI symptoms. The complexity and volume of statements in each subcategory required further analysis into smaller meaning unit clusters outlined under each subcategory (Figure 2).

Heart health.

Ten of the 12 research participants spoke to their perceived heart health and perceived susceptibility to an MI. This subcategory was analyzed into two meaning unit clusters: pro-heart health and con-heart health. Half of the participants spoke to both the pros and cons of their own heart health.

Pro-heart health.

Pro-heart health comprises the influencing factors and individual's thoughts that act to increase the threshold of one's susceptibility to MI and act in favor of the individual's cardiac health. In other words, someone with high pro-heart health would perceive their susceptibility as lower than someone with low pro-heart health. Several participants expressed their perception of a rather positive health state and utter astonishment that they had an MI. Some participants had recently received a cardiac diagnostic test (e.g., electrocardiogram, stress test, etc.) and felt reassured their cardiac health was sound.

"I was in good shape. I was in good health, you know. . . . Nothing, and then, this." (male, 57)

They did an EKG on me while I was having the pains and everything came out fine, so it was concluded that I was having some kind of muscular thing going on. I did a stress test. . . with the bicycle while hooked up on an EKG, so I actually felt pretty confident that my heart was okay. (male, 53)

Participants were astonished that they had no mentionable medical issues and then seemingly all of a sudden, they had an MI. In the participant's mind, an MI was a major event that they didn't see in their future. They saw an MI as a health event affecting *others.* Common statements were:

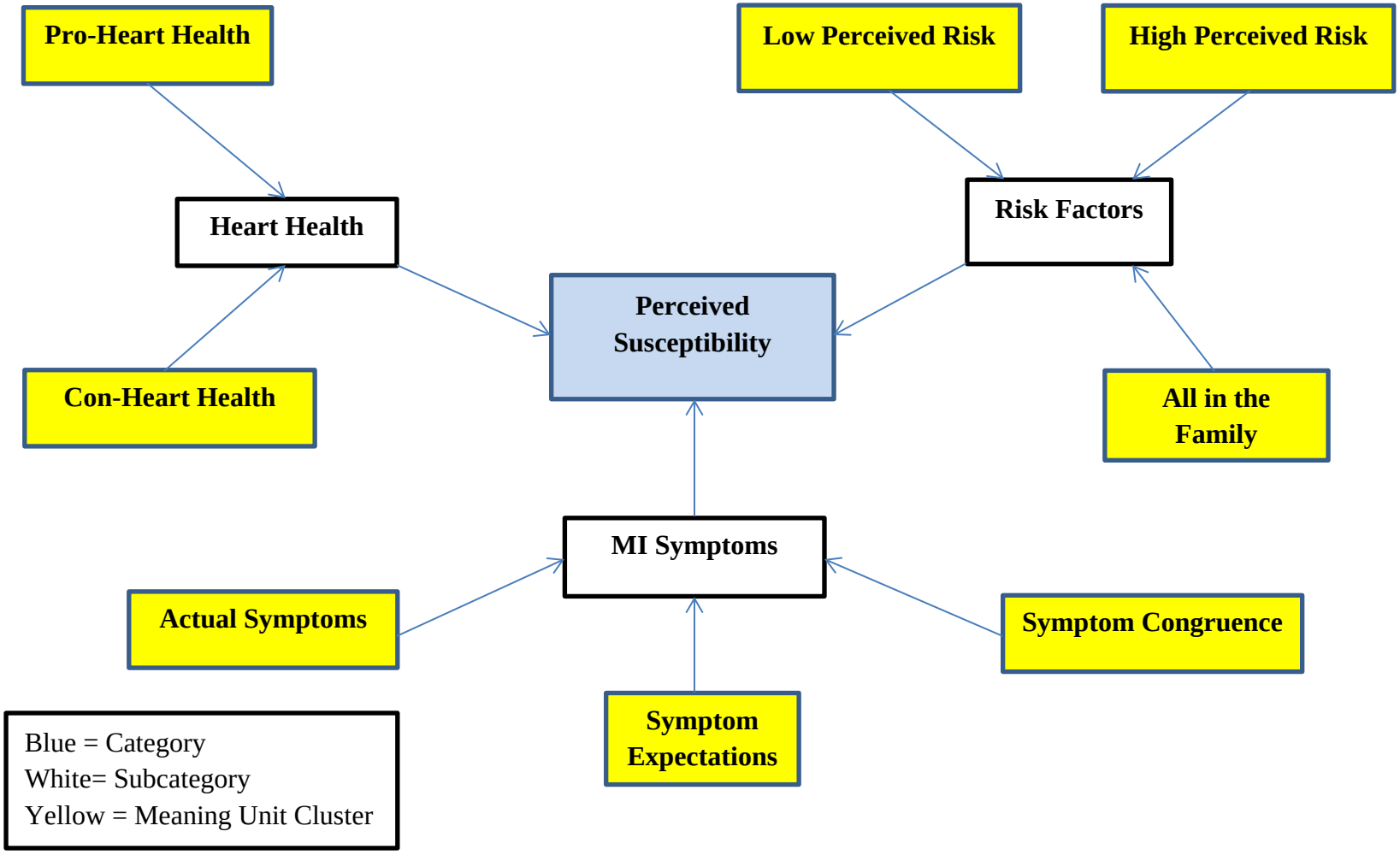
"I didn't know. It was a huge unknown factor, because I'd never. . .in 53 years I had 11 stitches, . . . one fractured bone, and a heart attack. That's it." (male, 53)

"It was a lot because I had not been on any medications for years. . . and I never been sick or anything." (female, 48)

Four participants worked full-time doing hard physical labor (e.g. appliance technician). These participants stated during their interviews that they worked hard and even practiced some preventative health care and thus were surprised by their MI event.

Yeah I was already doing good, and I thought I would be doing great. And that's why I never even suspected a heart attack. And I work hard, . . .and I exert

Figure 2. Perceived Susceptibility Exploded: Inclusion of Subcategories and Meaning Unit Clusters



myself. . . . And I don't get sick . . . I take my flu shot from the city . . . , but thank God, knock on wood. I get a little allergies and stuff, but that's about it. (male, 52)

. . . I've never had problems like this before. I've always worked all my life. . . . I never thought it was – it was gonna be my heart until I –I went in. the kind of work I would do – I did construction work, and I would have to lift, . . . heavy stuff and stuff like that and–. . . . It never bothered me.– that's why they shocked the shit out of me when they told me it was heart and stuff like this, damn. (female, 50)

In addition to having a positive perception of their own heart health, participants often held a vision of what a person who has an MI looks like. Participants said that obese people or those who lived recklessly or those who were older were the ones who were at risk for heart attacks. This phenomenon is illustrated in the following comments:

Like before you saw me today, you would have thought "oh this guy had a heart attack, he's got to be 300 pounds." Or some people think just because somebody has a heart attack or they're diabetic or a huge big guy, big person. And no people are surprised that "you had a heart attack?" (male, 44)

[There are] – seven kids. There's four boys and they're all older than me; none of them have had heart problems, and they all smoke and drink. I mean, I don't

drink. . . . One is Retired Navy. The other one. . .he's in the Marine Corps. They've got more stress than I do, I think. (male, 57)

For a person not being in the hospital at all and then to find out that you have a heart attack, what?. . . .I'm not that old and I'm not – I haven't done a lot, . . . led a rough life or anything like that. . . (female, 48)

When participants were asked if anyone else in their family had experienced an MI, the majority did have at least one other family member that had had an MI. However, three participants had not had family members experience an MI. Two of the three participants without a family history of MI made pro-health comments. Each of these three participants had thought about why they had an MI and what they may or may not have done to contribute to their MI (similar to those participants with a family history). I asked a male participant if anyone else in his family had experienced a heart attack. The participant responded emotionally and stated:

You know what---noooo. That was shocking. Nobody's had a heart attack in my family, and I'm the baby. . . .Nobody's ever had a heart attack. That's why I was kind of sad---I was like, "Why me?" So, it's not that was heart disease, which is good, because none of us---it's not in the family trait. So what it was, was [*sic*] my diet. That's what gave me. . . .Yeah. No, because it was a clot my bloodstream which is cholesterol and poor eatin', bad diet. [Sigh] Yep. (male, 52)

Though the participant had risk factors, he did not perceive the risk factors prior to his MI as MIs were not something that were a 'family trait.' Another participant with a family history had similar thoughts about his own low perceived susceptibility to an MI. His father had an MI in his presence years ago, but he stated,

> "Um, I was there when my dad had his [MI] and I never thought it was gonna happen to me." (male, 57)

This participant had a line of several male family members with the same lifestyle working on a farm and raising/growing their own food that had experienced an MI. Other members of the family had not experienced an MI. The participant pondered those that had experienced an MI, including himself, and thought out loud,

> "No, it's not, 'Why me?' It's, 'Why us?'" (male, 57)

The nature of the symptoms experienced contributed to participant false perceptions of pro-heart health and low perceived susceptibility to having an MI. Disappearing symptoms signaled an end to the unknown problem and restoration of health.

> On the drive. And that's when the chest pains went away, and I told her [wife] I was better now, my chest pains are done, I'm on my way home. (male, 61)

Prior to being informed of his MI diagnosis a young male said:

> It's six o'clock I'm feeling really good, I'm looking at the clock. I'm thinking in my head, . . . "If they get me out of here at nine or ten o'clock, I can be back to

work." You know, because I felt that good. That's how good the Nitro worked, the . . . blood flow I guess was better. The pain was gone . . .

Con-heart health.

A second meaning unit cluster under the subcategory of heart health is con-heart health. Con-heart health comprises the perceptions that act to decrease the threshold of one's perceived susceptibility to MI. In other words, someone with high con-heart health would perceive their susceptibility as higher than someone with low con-heart health. Five participants (four men, one woman) reported a daily routine that included unhealthy food and irregular exercise. None of the female participants exercised regularly. These lifestyle choices resulted in participants gaining weight over the years. Nine participants in the study had at least one family member that had experienced an MI. All participants had multiple risk factors for an MI; although they were not always apparent to the participant. Five participants admitted that experiencing and living through an MI was a wake-up call. One participant captured the feelings this way:

> So in the big picture I really look at what happened me as a a [*sic*] wake-up call you know, because I have sloughed off so much on [*sic*] eating properly and exercising properly. I put on quite a bit of weight. . . .one of my uncles, . . . died of heart attack at 55. He was sitting on the couch and my aunt asked him what he wanted for dinner, and he told her, and she went to the kitchen and came back and he was gone that quickly. (male, 53)

Susceptibility to MI, con-heart health outlines how the participants experience the vulnerability and even the fear of an MI. At some point, each of the ten participants in the heart health subcategory realized they were truly susceptible to a major cardiac event, and there was little to nothing they could do to prevent the MI from occurring. One participant that had experienced a previous cardiac event and who had a family history of three fatal MIs spoke about his most recent MI and his uncertain future as he approached 65 years of age:

> I was scared. I got---That one really scared me scared me [*sic*]. It scared me a lot. It scared me a lot. The first one not so much, because I guess I wasn't expecting it. But this time I knew it was happening. . . . I mean just knowing that like my dad passed at 65. My other brother passed at 65. Hey, is this something that's going to happen to me too when I'm 65, or am I going to live longer?" (male, 61)

Other participants spoke of their anxieties and fears related to not realizing the symptoms they experienced were due to an MI. They hadn't realized their health was threatened by an MI and this scared them, because they knew an MI could be fatal. Ten participants didn't recognize their symptoms as MI symptoms. Three worried they would have another MI and fail to recognize symptoms and again fail to seek immediate emergency health care.

> "I was just really afraid because like I said, I didn't know I was having one [an MI]." (female, 48)

". . . and that scared me even more because I didn't feel the heart attack. I just felt short winded and weak and a little stinging pain here, and it was like nothing." (male, 52)

The fear and sudden perceived susceptibility to having an MI was a reality check for these research participants. This sudden new perceived susceptibility led, in some cases, to changes in health behaviors. Since experiencing an MI, three of the participants had decreased number of cigarettes smoked per day and three had quit smoking altogether.

Risk factors.

Risk factors were a subcategory of perceived susceptibility. Risk factors for an MI include hypertension, hyperlipidemia, diabetes mellitus, smoking, abdominal obesity (body metabolic index $\geq$ 30.0 kg/m$^{2)}$, a lack of physical activity, low daily consumption of fruit and vegetables, and overconsumption of alcohol (Roger et al., 2010). In addition to these factors, the Mayo Clinic also cites a family history of MI, stress, and illegal drug use as contributors to MI risk (Mayo Clinic staff, 2013). Participant narratives addressed several risk factors including the following meaning unit clusters: a) diet, b) weight, c) exercise, d) cigarette smoking, e) alcohol and drug use, f) stress, and g) hypertension.

Low perceived risk.

Participants in this category related a perception of a positive health image and self-concept and frequently listed the risk factors they did NOT have.

"So I've always been you know fairly conscious of myself physically." (male, 53)

"The other thing with that is I don't smoke. I'm not a smoker. I'm not a drinker. I don't consume alcohol or beer." (male, 44)

Low perceived risk was perpetuated when participants had made positive lifestyle changes prior to their MI event. One young man who had used alcohol and illegal drugs for 25 years, stopped those behaviors five years prior to his MI, as he knew these behaviors were risk factors for several health issues:

> I just wanted to stop drinking and then the cocaine and the meth and then the marijuana slowly– I got kids I just quit about five years ago and so I thought I was getting better and now I had a heart attack after that. (male, 44)

High perceived risk.

All participants spoke about lifestyles that may have contributed to them being at high risk for having an MI. Common topics were diet, exercise, stress, smoking, and hypertension. Many participants linked their high fat and low fiber diet and large portions to an increased risk for MI.

> The sugar was something that was probably keeping me overweight. I eat candy--- I eat more candy than my kids do all put together. . . .Well I'm an appliance technician so I go from house to house and I go, go, go. . . . And there's not really a lunch schedule. You get home for dinner and it's like eat and run. 'Cause I've got to eat a sandwich, grab something and run to soccer practice. . . . You get caught in that time where your nutrition, your meals are not the main focus. (male, 44)

A participant spoke about his idea of traditional Mexican meals and how that fit into risk:

> “I don't know if it's just the way Mexicans eat. . . . It's, I guess, everything's greasy and,. . I don't know if that contributes to Mexicans and diabetes and heart attacks, but it probably does. . .” (male, 44)

> “You know over the years you get stuck in your routine with your meals and your stuff and then that's where your health is. So when something like this happens, you kind of a wake-up call.” (male, 44)

As participants spoke about nutrition and exercise, weight gain was often part of this discussion:

> . . .because I have sloughed off so much on. . .eating properly and exercising properly. I put on quite a bit of weight. As I got older and into my fifties I don't exercise as much as I used to. I was pretty good about it up until a couple years ago. (male, 53)

Though nine participants did not explicitly discuss stress in their narrative, stress was apparent from the discussions of competing roles and multiple issues in their life. Two participants described acute stressful events during their MI.

> “Then my sons were in trouble, three of them were in jail, and the stress of being there at the house by myself – she wasn’t here yet [referring to daughter-in-law].” (female, 58)

"Well, I really got upset here at work. To where, . . . I told my Department Manager or …, I said, 'Hey, yo. You're really stressing me out.'" (male, 57)

Multiple jobs and roles were common among participants and contributed considerable stress to their lives.

I really think it has to do with stress, really I do because this has been my life for a long time. And I don't know, is it true? Can stress really lead you to a heart attack? . . . . I really think stress has a lot to do with it. (female, 48)

Well it [blood pressure] was higher, usually it had been like one sixty, one seventy it had gone up to one eighty, but I never felt like uh lightheaded or anything like that, I never had those symptoms like some people do or headaches I never got those. I didn't really feel really abnormal, you know with it [hypertension]. (female, 48)

Participants spoke to the role smoking played in their risk for MI.

"I mean they said that that was probably what caused it, but I really don't think so. [referring to smoking]" (female, 48)

". . . and wasn't because my smoking or anything like that because everyone thinks it was because my smoking and stuff like that but it wasn't." (female, 50)

A male participant hypothesized during the interview about a possible connection between a recent addition of a phosphodiesterase to his medication regimen one month prior to his MI and the MI event:

> And he [primary HCP] asked me how my sex life was, and he gave me Cialis. When he took that physical – when I took that physical. I had never had--when I started taking those is when I started getting my heartburns. And I even told my wife! "I wonder if it's these pills." Now, why did he –? (male, 57)

All in the family.

All in the family is a meaning unit cluster of risk factors and refers to family history of MI. Nine of the participants had family members that had experienced an MI. In the case of seven participants, their father had had an MI. Three participants stated that their age at the time of their MI was the same or close to that of their father's age at the time of his MI. These experiences illustrated for participants their own mortality.

> "If you put there August 28th, I was still 43 years old [when I had my heart attack]. I was 43. And my dad, uh we were older when he had his heart attack. 43." (male, 44)

One participant was with his father as he experienced a massive MI and called EMS for the classic chest grabbing symptoms that had occurred. The participant explained he and his father were the same age when they had their MI. The participant went on to say,

"My age when he [father] had a massive heart attack. I took my dad's hand. Massive heart attack – he's had three open-heart surgeries." (male, 57)

A female participant relayed her thoughts and fears about following in her father's footsteps in regards to her own heart health:

". . . hopefully I'm not gonna follow in those footsteps [laugh] but, . . . I don't know, … if it's hereditary or what – heart disease is, but then again, you know, my dad, he had the heart attacks." (female, 48)

It became apparent that the participants may not have recognized their significant family history of MI until they began to tally everyone during the interview. One participant recalled,

"That was my mother's brother. In fact, both of her brothers died of heart attacks. My dad had one also, but he didn't die from it. He uh lived for a few more years and then had a stroke." (male, 53)

MI symptoms.

MI symptoms is a topic that each of the 12 participants spoke about in detail as they told their story of the MI experience. The majority of the participants (n = 10) didn't recognize the symptoms as ones indicative of an MI, although they hadn't felt anything like these symptoms before. This experience of unfamiliar symptoms led the participants to seek emergency help. Two participants who recognized their symptoms as an MI reported that the pain rendered them weak and incapable of carrying out simple tasks like walking. Each fought to retain their consciousness as they made the trip to the hospital.

These two participants had typical or what is often labeled classic symptoms, but recognized them. They reported their MI symptom experience as follows:

> . . . at 4:00 in the morning, I felt as if something had fallen on my chest. I thought it was the fan. That heavy. . . . And I woke up, and I – the first thing I noticed, there was nothing heavy on me. Yet I felt heaviness on my chest. A few seconds, just seconds, I started sweating. My hair, my clothes, my pajamas were wet. And just seconds, I couldn't breathe very good. . . . we were on I-35, heading south, passing town, and I remember that I was so weak and I was getting unconscious. . . . Because that's when it started hurting all my arm, and I started getting weaker, more shortness of breath. I couldn't get my breath. Matter of fact, I started sliding off the car seat. . . When we almost got to the hospital, I was very weak. And I was crying, I was scared. [I] got out from the car, and I wanted to run. I wanted to run through those emergency room doors, but I couldn't. There was a wheelchair in the entrance there on the sidewalk. So my husband threw me in the wheelchair and rolled me in. (female, 60)

> It was hurt – it was hurting really, really bad when I first started feeling this, it was like you had a tire that was coming down on your chest with a hydraulic jack. Just releasing it slowly, and slowly, and slowly. . . .– "I gotta go. I gotta get off this tractor." I said, "If I faint or whatever –" I don't know what's going on. . . . You're running out of breath. it's like I said, it's like an elephant has got it's leg

and it's going down slowly, slowly, and slowly. And it's like –you can't breathe. I mean,– you can't do nothing. . . helpless. You can't do nothing. (male, 57)

Other participants had typical symptoms, but didn't recognize them as an MI. While most (n = 10) of the participants did not recognize the symptoms they were having as an MI, the feeling of incapacitation was directly voiced by all participants. They had to stop what they were doing and had no strength to function. One participant who didn't recognize the origin of her symptoms and didn't seek emergency care for two to three hours described her experience this way:

It's not like having the flu, . . . it's something totally different because .. – the pain is constantly there. . . . And you're really -- you get – it – when it gets to your hands and your arms to where you really can't – you can't do nothing because it hurts really bad, and your arms hurt. All this hurts really bad to where you really – you really don't feel like moving. (female, 50)

Actual symptoms and symptom expectations.

Even though these participants experienced typical MI symptoms, their symptoms did not match their expectations of what an MI feels like. When actual symptoms didn't meet participant symptom expectations, the incongruence resulted in a lack of cardiac symptom recognition. Participants often assigned symptoms as being gastrointestinal or even respiratory in origin.

Oh, it was probably like 30 [referring to pain on 0-10 pain scale]. I'm telling you, it was really – it hurt me so bad. It was just like –your esophagus it's just like a

> hole, and it's just hurting constantly from here to all the way down to my chest. I could just feel like it's a big pipe or a hole, constantly hurting like it was red burning. . . Have you ever had something hot, really hot, . . . or even hot liquid where you drink hot liquid, maybe too hot, you shouldn't have swallowed it probably and it goes down really hot. That's the way it felt, just like that all the time. . . . Just take my esophagus out. … just get this out and hurry up, I couldn't stand it. (female, 48)

> . . . and then the next thing you know I'm sitting over there by the table I start getting like winded, winded, started getting winded like breathing difficulty. But the pain didn't increase, it stayed the same. So I didn't know, it didn't trigger me that it was my heart or anything. So as I'm sitting there, I stood up, and I started getting like pains on my, on both sides my shoulders, like a stinging pain. (male, 52)

A female participant experienced a combination of typical and atypical symptoms:

> I don't know – I – to be honest with you I didn't even know I was having one. All I know is that I wasn't feeling good and stuff, so I went to go take me – I couldn't sleep. . . I would get cold and I would get hot and then I would hurt really bad. All right here with my arms and my chest really bad. Like something real heavy on you, but then when you try to get up and you can't. (female, 50)

Other people that experience atypical MI symptoms are often still able to function in their various roles and will push on. Participants expected to feel quite ill with an MI and be incapacitated. If a problem is not apparent, the person experiencing an MI may simply carry on.

> I just went in for being dehydrated like what I usually went in for and that's what I thought it was. . . . And they were like, do you feel all right? And I was like, yeah, I feel pretty good. I want to go to work. (male, 44)

Symptom congruence.

Some people expect to feel extreme and debilitating symptoms including pain if they were having an MI. When those expectations were not met, they often did not recognize symptoms as an MI.

> "I was like [I] just had a heart attack, . . . and I wasn't even feeling really bad, I mean my throat was still hurting or whatever but then, afterwards, it went away. I didn't have it anymore." (female, 48)

A number of the participants referred to the MIs depicted on television or in the movies in their description of the dramatic MI. The Hollywood depiction of the MI was the proverbial measuring stick for the MI experience.

> "And I still didn't have the chronic pain like you see most people [in the movies] grabbing their chest and falling. . . It was just a nagging little pain." (male, 52)

> Diane [nurse at cardiology clinic] told me later that. . . ---you have to know your pain---everyone has a different indicator. . . I always of course thought it was a dramatic clutching of the heart, and. . . keeling over type thing. But that wasn't the case at all. (male, 53)

> "I started picturing those movies where. . . 'He's going into cardiac arrest' and everybody starts working on you and everything." (male, 52)

> Falling over ----. . . can't even breathe, . . . I don't want to feel all that. . . I guess I got lucky. . . . you see them on TV. Like . . . and that's what . . . I would have expected. But. . . I got lucky. (male, 44)

Without exception, participants expected an MI to involve a dramatic clutching of the chest, being unable to breathe, and dropping suddenly to the ground. This incongruence between expected and experienced symptoms affected the participant's decisions to seek treatment for their symptoms. Participants made decisions to drive themselves or have family members drive them to the hospital.

> So, my wife came from home and picked me up, and we went to the hospital. So at that point, I didn't feel that I needed to go to the emergency room, but at that point I didn't know that it was a heart attack, I just felt really bad. . . . So sometimes you just may not feel that it's a heart attack, you may think it's something else. But in my in my experience with my mom and dad, I didn't have

> the. . . pains in the arms or the jaw locking or nothing, it was more a sensation that stayed in my chest. . . . I didn't know what to think. I just felt like maybe it was something that I ate during that day, indigestion something. But it came to be a heart attack. (male, 44)

> ". . . because it wasn't apparent, ... I didn't go in with the chest [pain], . . . or the real dramatic stuff whatever, no. … And I was talking and everything." (female, 48)

As a result of self education two participants experienced congruence between their experienced MI symptoms and their expectations.

> I did think heart attack. I did think a heart attack right away. . . . There was – because I had all the quick symptoms that I had read about. And I was getting worse real quick. It was just seconds. And by the time I was in the car, that all this left side started numbing. (female, 60)

> "I mean, you know I knew something was going on. The same thing happened with my dad and he's still living. And I've read up on it, what to look forward to." (male, 57)

Category: Perceived Severity

Perceived severity is the second category derived from the participant's narratives. Perceived severity is the perception of the seriousness of the MI, including

medical consequences (disability, pain, death) and social consequences (effects on occupation, family, and social relations) (Becker, Maiman et al., 1977; Janz & Becker, 1984; Rosenstock et al., 1988). Only one participant did not speak about her perceived severity of an MI. There was nothing obviously different about this participant, and she did understand the severity and consequences of the MI as she had been hospitalized several times since her MI experience. However, she didn't speak directly about perceived severity.

Health care providers affected participant assessment of the severity of their MI. Three participants stated during the interview their cardiologist had told them they didn't have any real cardiac damage post-MI.

> Yeah I think in my case he [doctor] said that when I talked to about it that he said that he believes through his experience, naturally he couldn't tell right away, but he didn't think there was any permanent damage done-- little if any is what he said. So but we won't be able to really tell until April 17 until we get all those results back. (male, 53)

> "But from what---the way I understood it, was he [doctor] said there was no damage done to my heart or anything like that. Which was really good. He said that's a plus right there." (male, 61)

> And the doctor tell me, “You can go ahead and go to work tomorrow if you want, right away.” Yeah. He tells me, “Nothing wrong, you can go to work.” So, I don’t feel bad when I get out of there. I don’t feel bad at all. I can walk and everything, but I mean I don’t want to take any chances. So, I just call my boss here and tell him I’m going to take the Friday off. (male, 65)

Other participants realized they were fortunate to survive their MI.

> Luckily that [major heart attack] didn't happen to me. I just. . . Yeah you never know what heart attack you’re having, if it’s a major or a minor. A mild stuff. I felt like it was the mild stuff, but it turns out it could have been bad. (male, 44)

An MI is a potentially life altering event. Often people start thinking about their life, mortality, and spirituality. Several participants spoke about a “wake-up call” during the interviews.

> “– Hereditary-wise though, do you think that I caught mine just in time? Or will I ever go through that – what he did [father with multiple MIs and surgery] – went through? Or was this a wake-up call?” (male, 57)

> “. . . you know ah creation kind of telling me well, ‘you need to start taking care of yourself OR this could happen. You may not be so fortunate next time.’”(male, 53)

"That's why I know there wasn't time for me to go because if it was, I would have went I think. God had me here for another reason– I really do think so. I know so. . ." (female, 48)

And that's what they call the widow maker, because you don't normally survive that. . . . And that's when I kind of panicked a little bit, when they told me that. And I was like, "Wow." So I must have some angels watching over me or something. For sure. . . . Totally!. . . . Because—I was scared. I thought I was going to die. (male, 52)

Other participants were struck with how fortunate they were to have received medical treatment so rapidly for their MI.

And then a few minutes later – an hour or so, the dentist was standing there talking to me. So, the doctor– told me that if you would have been somewhere else, at work or else, you wouldn't be here today. You wouldn't have made it to the hospital because of probably some blood clot right below my heart that stopped right there, so – I don't know what they did. (male, 67)

When you hear those words you know it's almost like you know you [have] cancer or something except something much more immediate. And I was honestly I was stunned. I was absolutely stunned and speechless and uh. . . . He said, "the bottom line is we're [*sic*] the clock is ticking right now." (male, 53)

The two participants that recognized they were having an MI were told by their cardiologists of the extent of damage to their cardiac muscle.

> – So, when I was having it – well, when I was having these heartburns, that's what the guy said. He says, "You've been having little h – heart attacks." . . . . He goes, "Because with your blood – you know, looking at your blood, and there's damage. There's a lot of damage." . . . . He goes, "Then you were – it was getting ready to blow up." That's what he said. That I remember. He says, "It was getting ready to blow up." He goes, "We don't know how bad it is until the cardiologist sees it." (male, 57)

> "I, I said, 'This is it.' And I thought I was going to die." Because I was very weak. And I thought, a heart attack right away. I thought I was going to die. . . . I thought I was dying already. And I kept telling my husband, I said, "You've got to make it there, because I don't think I'm going to make it. You've got to drive faster. I'm not going to make it." And, my voice, I remember it was a whisper by that time. . . . I was just getting weaker, and I couldn't breathe. I kept wanting to breathe and breathe. (female, 60)

At least half of the interviews got very emotional at one point as the participant thought back to this frightening period of time. Seven participants used the words "fear," "scared," or "worried." Several participants had to pause and choke back tears during the

interview as they thought back to the fear for themselves and the potential loss for their families if they died.

> "In that moment, you think about a lot of things. A bunch of things. First of all my wife." (male, 65)

> And my wife was standing there. . . I started thinking oh my God, and I told her, you know, I might die and not to----to be ready and not to assume that everything was gonna be all right, because I was picturing that going into cardiac arrest mode. But luckily and fortunately everything came out fine and everything. (male, 52)

> My sons had all come and were in the waiting room as well. So once it was over they all came in and saw me which was pretty emotional. I think they were [participant crying] We lost their mom to cancer about 16 years. So. This would have been pretty, pretty devastating to them. . . I have a big extended family. . . we are very close, all of us. We lost one of my sisters back in '06 to liver disease. . . So it was it was pretty scary. It was one of those things where you can't even imagine the repercussions from, . . . something like this, if I hadn't made it. (male, 53)

Participants were scared by physical symptoms they had never felt before and that were unresponsive to self-treatment.

> "Uh, nothing was helping it and that's what really also scared me because I could – if I had my heartburns, I could take Rolaids and it'll go away." (male, 57)

The same male participant described driving himself to the hospital:

> I remember when I was going to my truck, . . . I fell down because it was so bad – the pain was so bad. And I got in my truck, and I remember – it's – here, out in the country, there's gates. . . . I just ran through the gate. . . . I didn't have time to get out. I didn't know what was going on. I was more worried about myself. Luckily, no cows didn't get out. (male, 57)

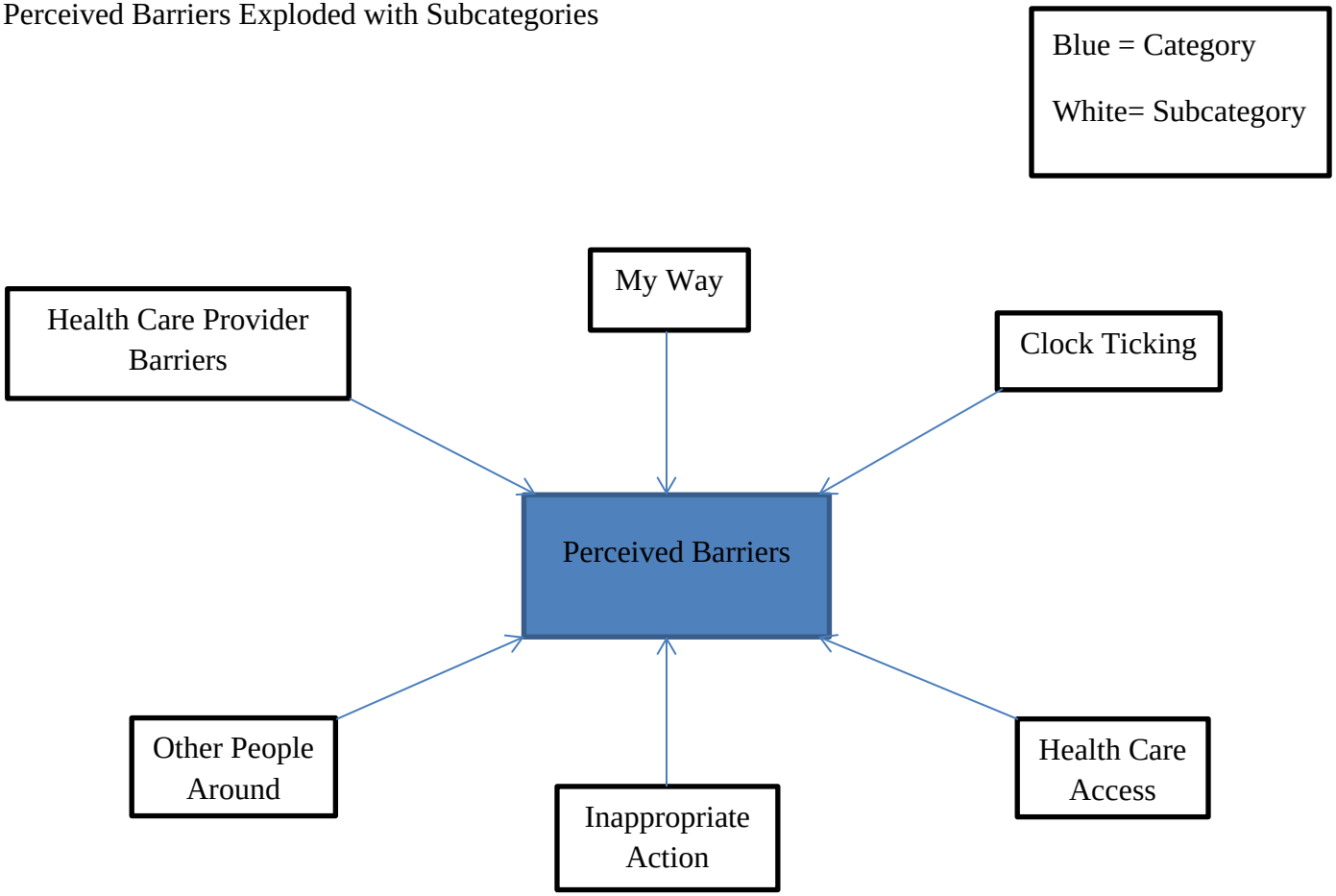
Category: Perceived Barriers

Perceived barriers are beliefs and estimates concerning the costs of the advised action. Barriers prevent or delay an initiation of emergency care during an MI. The category of perceived barriers was the most complex of the categories revealed in the participant narratives and consists of six subcategories: a) my way, b) health care provider (HCP) barriers, c) health care access, d) inappropriate action, e) clock ticking, and f) other people around (Figure 3). Participants were often aware of obvious barriers to obtaining emergency care (e.g., not having a telephone), but they were not aware of more covert barriers (e.g. calling home to have a spouse come pick them up and drive them to the hospital).

My way.

My way encompasses the statements participants made about their actions and rationale for those actions in the pre-hospital period of an MI. Four participants

Figure 3. Perceived Barriers Exploded with Subcategories



specifically spoke of their control over their body and that they felt they knew how much pain they could take.

> I mean if. . . I feel like pretty much like I know what's going on. And I know if I need an ambulance I would know if I need them, or if I could drive myself there or something like that. . . I just feel like, I don't know, like I have control. I could be wrong, I don't know, but just I'm telling you what I feel. I feel like I just have control over my body or something, and I know what I can do that what I can do with it or how much it'll take and what it can't take so. (male, 61)

> "I'm not – my body will – I can tell when my body – when I need to go in. Because I can tell it with my body." (female, 50)

> Your body – our bodies lets us know how far to go really, I mean, …we're not functioning or, … to where enough – it's just your brain, I mean, it's funny because to me it's like your brain tells you okay, enough is enough already. You need to go to the hospital. . . because that's what I said and I don't – I'm not one to go to the emergency room – (female, 48)

> "That depends. It would [have] taken a lot for me to call 9-1-1." (male, 57)

When prompted to elaborate, the participant gave a long sigh and replied,

> "I know myself. And, at the time, I didn't think I needed it. Uh, I know how much pain I could take. . . being in the military. . . Marine Corps taught me how to deal with pain." (male, 57)

For two participants it was about avoiding the hospital.

> I just don't like going to the hospitals to be honest with you. It has to take a lot for me to go. I don't even like going to see the doctors and stuff. It really has to [be] a lot for me to really go to see a doctor or, uh, stuff like that because I really don't – I try to – I don't know. I guess I try to do it here at the house and take medications here –. . . . I try to avoid them as much as possible. (female, 50)

> Because, we didn't have a car, there was no where they [family] can go up there [hospital] and see me, there's no way that anybody could go. And they wouldn't let anybody in the ambulance. So I didn't want to go, I told him [son], "No." (female, 58)

Participants thought that calling EMS would delay emergency treatment, and it would be faster for them to drive to the hospital themselves.

> It's gonna take the ambulance at least, at least ten minutes to get there. . . And then they're going to carry me all the way to the medical center [*sic*], although I didn't think that the EMS people would get me going. . . That they were supposed to do at the hospital when I got there. (female, 60)

Another barrier to initiating emergency care for MI symptoms was the cost of an ambulance. Most of these participants had insurance, but both those with and without insurance cited the expense of an ambulance as a barrier to calling EMS.

> . . . financially you start thinking oh no you call the ambulance, everyone has in their mind that if you called ambulance it's expensive to ride in an ambulance, you know. And I think that's where people kind of get caught between life and death and, but if you have a ride to already get in the car and go. . . . The other thing, the way I think is that by the time the ambulance gets here, I can already be in somebody's vehicle and get there. (male, 44)

> The bills mostly. I mean, other than that, you know, I wouldn't care –. . . . They're very high, . . . it has to be charged, I mean, it's a life or death, I don't care. You know, and I have a lot of bills too right now, from it because even though I'm on the MAP– I'm not covered through it because I chose the medical center [*sic*]. I mean I was supposed to go to the county hospital [*sic*]. (female, 48)

Health care provider barriers.

This subcategory of barriers was revealed in 67% of the participants' narratives. Interactions with HCPs, whether it was a recent physical or stress test within normal limits, MI symptoms interpreted as being from a non-cardiac issue, or delayed diagnosis in the ED, posed barriers to seeking emergency medical services when MI symptoms arose (Figure 3). These participants experienced HCP barriers both in the clinic and once

they reached the hospital with their MI. Reaching the doors of the ED did not necessarily mean a rapid diagnosis and treatment for every participant. One participant had a negative stress electrocardiogram (EKG) in the past and thought he was at low risk for an MI. Participants had in their mind that they were fine as they had *just* been to the doctor and had a clean bill of health.

> I had a physical a month before in November and my doctor said my cholesterol was good, and there's nothing wrong, and then, a month later [pauses] I had this heart attack. . . I don't know how in detail or thorough they're go into your blood –I think I would have prevented this. . . (male, 57)

> I think it was March or April. He [patient] had just gone to have his heart checked and the cardiologist, he said everything was fine because he had stents put in about ten years ago. . . . But they were clear. So that was – that was all clear when we did the – (male, 67)

> And I had just been to to a a a [*sic*] stress test about a month before and didn't catch nothing. That was my best one I had ever done. I was in shape and everything. And he [cardiologist] says, "We don't understand. I mean everything came out good on the stress test. How could this be?" But that was the best stress test I had. (male, 61)

Female participants related experiences where their MI symptoms were misdiagnosed by their primary care provider.

> Well actually I had two days prior to my heart attack well which I was aware of my heart attack I had been to my doctor, my own doctor was given--and they found some through my blood work, found some other problems with me, thyroid, low thyroid, low vitamin D deficiency. . . . I had told my doctor that. I said, “for the past two weeks I have been feeling like my esophagus is bothering me.” He prescribed me something for GERD. (female, 48)

Four participants experienced a delay in either diagnosis or interventional procedure after reaching the ED. One participant was admitted to the telemetry floor of a small hospital one evening, but didn’t find out he had experienced an MI until 14 hours later when he needed to be transferred to another facility for a cardiac catheterization. The participant stated,

> “I’m thinking that the EKG came fine. Came back fine, so they’re thinking, maybe they're not thinking heart attack here. But with the same pain, no worse, no better, one o'clock-ish they get me to a room.” (male, 44)

> Well, they don’t have the facilities in at small hospital [to do a cardiac catheterization or percutaneous coronary intervention]. . . . I remember them saying they were gonna take me that night to do the angio [pauses] but there was

> no beds. And I had to wait 'til the next morning. So, they were giving me medicine, and I just remember taking a lot of morphine. (male, 57)

Even when participants with a cardiac history contacted their primary care provider, they experienced delays.

> And I came home and of course my wife said you know, "you need to call the doctor right now." So I called the doctor and everything. . . . I think it was a Tuesday. . . I remember calling the nurse, ----receptionist and she said they had nothing until Friday. I says, [*sic*] "oh I have chest pains." "I'm sorry we don't have anything available for you right now until Friday, because I called the doctor." So, I said, "okay I'll take it." (male, 61)

> And they knew this. They knew my blood pressure was high and – and when I would go to my doctor, she knew that, but because they would think that I was in pain, you know, and I would say that too, well, I'm in a lot – are you in pain? Well, yeah, I am, you know, so then it's like okay, well, that's probably why because they never kept me there, you know. And it would be like 160, 170, I mean, that's pretty high. And but nobody ever kept me there . . . or made sure it went down or gave me something for it. Nobody ever did. (female, 48)

In an extreme case one female participant experienced misdiagnosis from two separate health care providers.

> I went to see my doctor once, complaining of my stomach being so big. And I felt so bloated. . . . And she, she didn't do anything about it. She just said, "Well, you know, just eat better," . . . I kept telling her, I said, "I'm afraid, I'm afraid I might have some type of ovarian cancer or something like that." I said, "Because it's different." . . . Uh, of course I went to see the doctor, and she never, she never tied the, my bloated stomach to anything else. You know? She didn't do a chest X-ray. I had gone to the doctor. And they said it was a strep throat. I had a lot of coughing. On October 1st, I had gone to the doctor. Didn't do a swab on me or anything. They just said it was strep, and, treated me for strep. I had difficulty breathing at the time. . . . When I went to see the doctor. They didn't do a chest X-ray or anything. They said it was strep. Didn't have a sore throat, didn't have nothing. And they said it was strep. Gave me some penicillin, a penicillin shot and everything. Sent me home. I continued coughing and coughing and coughing a lot, shortness of breath. (female, 60)

Once this same female participant reached the ED, she experienced further barriers to diagnosis and treatment by the ED nurses and physician. This participant continued with her clear narration, making her feelings so palpable:

> Well, when I, when we got there, they started with the paperwork and everything, and Armando said, "She thinks she's having a heart attack, so let's, let's get started on her and I'll help you with the paperwork in a little bit." . . . . "Uh, well, we've got to have this information before we put her in." They did get me on a

bed, and Armando was giving them the information. And then this nurse came, and he said, “You’re making a big deal out of this. Do you always act this way?” . . . . And he says, “Well, have you received any treatment for anything lately?” And I said, “They’ve been treating me for strep throat.” “Oh my goodness,” he said. And kind of got away from me. . . . He’s saying to the other nurse, yeah. She’s – and I said, “There’s something more wrong with me.” I said, “Listen to me.” So then my husband came and he said, “Does she act like this all the time?” He said, “She’s hysterical.” And my husband said, “No, she doesn’t. You know, she, uh, doesn’t have tolerance for pain very much. She never has had a tolerance for pain.” He says, “But she has progressed even weaker and weaker as we came in the car.” And Armando gave her, gave them the symptoms. And they were just poking around, visiting around, just talking. . . .

And by that time, there was [*sic*] some other people around, I remember. And they were talking about the patient in the other bed, that didn’t have insurance . . . And I kept looking at ‘em, and everything started getting very distant for me. . . . I could hear them. I wanted to talk. I couldn’t talk very well. I could hear what they were saying, but they weren’t paying attention to me. . . . And then they did an EKG and uh, I remember somebody walking up. I don’t know if it was a doctor at the time. And the doctor said, “EKG’s fine.” And they says, “Oh, it’s probably part of her strep throat that she’s talking about.”

After follow up with a cardiologist she was informed that she had experienced two heart attacks and was in congestive heart failure.

Health care access: Transportation and insurance.

Participants experiencing an MI encountered a barrier to the rapid initiation of emergency care when they climbed into a privately owned vehicle to go to the hospital. Of the 12 participants, 10 arrived at a hospital via a privately owned vehicle. Two participants used EMS. One participant using EMS recalled what her son said to her,

> "Yeah, 'You're going to the hospital.' Yeah, that's all he said, 'You're going to the hospital, no matter what you say.'" (female, 58)

The other participant's dentist and staff called EMS during his MI.

Three male participants lived very close to at least one hospital and each had their wife drive them to the hospital stating it would be much quicker than an ambulance.

> "And uh so she (wife) drove me down to the ER and dropped me off, and I walked in." (male, 53)

> "So it took like two minutes and we were there. Yeah she [wife] drove me there." (male, 52)

Of the 10 participants that traveled to the hospital in a privately owned vehicle, it was not a consideration for eight to call 9-1-1 or activate EMS. Two participants did consider calling EMS for at least a moment and shared their reasoning with why they chose not to call or have someone around them call EMS.

> The two parents did ask about calling ambulance calling and I was just trying to relax, cause at that point you don't know it's a heart attack. I mean if I knew at that point that it was a heart attack "oh yeah, maybe we need to get someone. An ambulance or EMS here." But, I mean now. . . At that point, you just don't want to deal with…I think at that point where you might think it's a heart attack, but you really don't know. . . . cause our [Hispanics and Mexicans] mindset is "I can drive myself there. I can save a little money,", if I can get myself there. 'Cause my wife can actually come pick me up real quick. (male, 44)

> I just could not breathe. So, I told my husband at the time, I said, "I have classic symptoms of a heart attack." . . . . And I said, "You've got to take me right away" . . . . "To the hospital." I said because the hospital was close. . . . "By the time we get a [*sic*] emergency vehicle over here, and by the time we go over there, I think it's going to be too late." We decided to do it quick. (female, 60)

Three participants that drove to the hospital themselves or had someone else drive told of the frightening drive to the hospital.

> I was laying down in the seat. I was laying back. – But it's true: it's true don't let no body fall asleep, they get too relaxed and then they just. . . the heart attack could actually hit you dead on. You get too relaxed, and you're just---you're quiet and not saying nothing. If a heart attack hits you during that time that you are relaxed, if you can feel somebody talking to you and pushing on you, you got to

try to respond. ‘Cause you kinda---She's driving and she's afraid she's pushing on me, “are you okay, are you okay?” But I finally responded, “yeah, just keep going. Just-- Are we almost there?” (male, 44)

We got in the car real quick. It was just a matter of a few minutes, we were on the road. When we were on the road, I started getting my neck pain and left and my arm pain. . . . From the interstate and saying, “Armando, we’re almost there, but I think that you need to speed up.” So he did. He put the emergency lights, and I remember going real fast, that I could see the 18-wheelers just – we were just passing them. . . . I thought – did I make the right decision, you know, to go by car? (female, 60)

One participant drove himself to the hospital while suspecting an MI.

And I drove myself to the hospital and, I mean [pauses] seriously, I didn’t know what was going on. My mind was like – I don’t even remember, ... when I was driving, I mean, there was so much going on: Am I gonna make it? Uh, “Eddie, make sure that you pass out and – it’s going through my mind.” Just things that I remember. “Slow down just in case, you know, some school bus is going.” And, “I gotta hurry, but you need to be careful.” This is what’s going through my mind. . . . Um, when I finally got to the hospital [*sic*], I remember I went to the emergency room, honked the horn because the doors automatically open – and passed out. (male, 57)

Additional participants revealed they drove themselves home or to the hospital with MI symptoms. One participant that knew he was having an MI stated,

> "– I went to the house, and then, from the house, I had to crawl to my truck. Um, and that's when I [pauses] went through the gate, and I drove myself to the – to the hospital." (male, 57)

> "Yeah, I was feeling woozy. I didn't feel like driving, but I drove myself home." (male, 44)

Out of the 12 participants, four did not have private insurance. Of these four, only one mentioned cost as a factor to consider as a reason for not activating EMS, but she stated that would not stop her from activating EMS if she needed to. Among the eight insured participants, insurance was not a significant factor for them in the decision to initiation emergency care. Two participants made remarks about cost being a factor for most people with MI symptoms not seeking care, but did not cite cost as a factor in their own situations.

> Because it's not worth taking a chance, because I have insurance. So that's the biggest factor of all. . . . Most people don't go, if they don't have. Because it's expensive. . . . Oh yeah your life is more those poor people just lay down, and they hope it goes away, and they don't wake up. (male, 52)

Another participant spoke about the cost of medical insurance. He saw himself paying these monthly premiums for a service he wasn't using or needing. The participant explained:

> I used to tell her, "I just hate them taking that money out. Why don't we just take the money out, I haven't been to the doctor in almost two years. Why don't we just get some kind of major medical thing and let this go and stuff." I don't complain about paying those premiums anymore. (male, 53)

Inappropriate action/self-efficacy.

Ten (including one under sedation) people didn't recognize their symptoms as signaling an MI, and attempted self-treatment for their symptoms (Figure 3). Commonly they laid down to rest. Symptoms were often interpreted as being gastrointestinal in origin, and a number of participants took some kind of antacid.

> I had been telling my mom too, my esophagus hurts. I bought the throat lozenges, I bought the cough medicine, I bought all that stuff. I didn't know. I just wanted something to soothe it, so nothing did, nothing at all, just kept getting worse, yeah. (female, 48)

> ". . . and nothing was taking the heartburns away. Now, I was taking Tums, and Rolaids, and everything, and nothing." (male, 57)

". . . it would help it and even I thought it would maybe take it away or make it worse, but it would like help it like a soda. . ." (female,48)

"And, when I finally got to my truck, I went home, and I sat – I sat on the couch, this gotta get away. Uh, that's when I was drinking my Sprite." (male, 57)

. . . so I drank a Coke or 7-Up or something to help me, belch maybe get the air out. And it didn't work, so the pain stayed there. And we still and think nothing of it. So my wife told me to go lay down and see if it would get better. I laid down for a minute or two. Got up, cause it didn't feel like it was gonna go away or nothing. It kept stinging. So, I told her I was going to go take a shower, in case I have to go to the hospital. (male, 52)

Four participants lay down as they were experiencing symptoms, hoping these sensations would pass.

"And I just felt bad so I came home, laid down and the next morning I wasn't feeling good, so my wife thought I was dehydrated again, so she took me to the hospital." (male, 44)

During the pre-hospital period, there were at least three participants that took a shower in the midst of their symptoms.

. . . so I went to go take my shower and figured maybe that will help me some and I went to go lay down. . . . So I laid back and everything and didn't – I got up

and I knew something was wrong, but I didn't know what was wrong, so I called – I woke up a friend of mine that I was living with –I was having a heart attack, which I didn't know I was having one. He took me to the hospital. (female, 50)

Two participants felt their MI symptoms and had a strong urge to smoke a cigarette.

I went outside, I smoked a cigarette, and I thought, my nerves would calm down and it'll be okay. Nope. My son got out after me. "You're here, you're having a heart attack, and you're smoking." I told him, "I need it for my nerves." (female, 58)

Though only two participants strongly suspected they were having an MI, five participants took aspirin in the pre-hospital period.

And two parents without even coming at me, they went over to a first aid kit and gave me a couple of aspirin. And at that point, I sat down and relaxed for a little bit and they asked me "you gotta go to the hospital." I decided to call my wife to come pick me up, and she knows that if I'm calling her to go the doctor, there's something wrong. You know, we're just not the kind that just gets up and goes to the doctor. It just doesn't happen. . . (male, 44).

One of the participants that recognized his symptoms as cardiac in nature, recalled his father (with a cardiac history) telling him to take aspirin.

". . . but when I was at the couch, I was also taking some Bayer aspirins. . . I took – chewed three aspirins. I remember. (male, 57)

> I told my husband, I says, "Give me an aspirin." And he said, "You want an aspirin or do you want a nitroglycerin?" Because he had a nitroglycerin. . . . And I said, "No, just give me an aspirin." And when he gave me an aspirin, I took two. . . . Regular aspirin. (female, 60)

Three participants ingested nitroglycerin prior to reaching the hospital. The wife of the participant that began having symptoms in the dentist chair stated,

> "They gave him two of that [nitro] and it wouldn't work, so that's when they called 9-1-1." (male, 67)

Another participant obtained a new prescription for nitroglycerin in lieu of seeing the doctor for four days after he called for an appointment. The participant exclaimed,

> "Those things [nitro] work wonders! Oh my God, oh my God those things are so good. I mean I started getting chest pain I popped two of those under my tongue." (male, 61)

The final participant with a significant health history took both aspirin and nitroglycerin as part of her self-treatment. She also went outside to smoke. The participant explained:

> Yeah, nitroglycerin. . . . I already had some. They already had given me some. Well, my doctor did a while back, and I took those. I already had taken five of them – five or six. . . . Aspirin, but I had already taken that earlier. I was used to taking my medications early. Around five p.m. or six p.m. I would take all my pills. (female, 58)

Five participants made at least one phone call to a spouse or family member once they started experiencing MI symptoms in the pre-hospital period. Most of these phone calls were to ask for a ride to the hospital, but one was to tell a spouse the participant was going to the hospital.

> What she do is call one of my sons, and he take me to the hospital. . . . I mean you don't think really. You don't think. You just want to get that pressure off of you and that pain. Especially the pain. It's a bad pain. Real bad. So, you just want to get rid of the pain. You not really thinking…not really thinking of the ambulance, police, or whatever. You not thinking none of that. (male, 65)

> And I called my wife right away. . . . I says, "well let me see if I can find something." And of course, I was staying at a hotel in O'Connor. And uh I got to the hotel before I could find any offices or anything [hospital or clinic] like that, so I checked out, started driving back home [three hours] and then my chest pain went away. So then I came home. (male, 61)

> I know most people--you already have a ride they say, "let's just go." But with a person that hasn't had the heart attack---the experience—they would be prone to say, "no, no, no. Let's wait, I might feel better. " Cause I kind of went a little bit through that, before I did call my wife. 'Cause I was thinking I could get through this it's just a belly ache or maybe something I ate wrong, something bad I ate, but

it just stayed there. (male, 44)

Clock ticking.

Clock ticking is a brief but vital subcategory of perceived barriers. Nine of the participants arrived at the hospital within two to three hours of symptom onset (Figure 3), though not all of these participants were treated for an MI immediately.

> Well, it's probably about a 10 or 15 minute drive from here over there and honestly what happened was she [wife] said "well I was just about take a shower; can you wait a few minutes?" and I said, "sure." And I just kind of laid down on the bed, while she took a quick shower, five or 10 minutes. (male, 53)

Other participants reported experiencing in-hospital delays.

> My thought was I gotta do something so when I got up, it was again a bad head rush, and so that was around 6:45 p.m. So, by 7:30 p.m. we are the emergency room. . . . It was the same pain from 7:30-ish when I got there to one o'clock in the morning when they finally got me into a room on the third floor. (male, 44)

> By about 4:15 a.m. or 4:30 a.m. maybe [arrived at hospital]. . . . Somewhere around that time. . . . Yeah. But it took 'em – I don't know – well, I lost track of time while I was in there. But I know that I was crying and I was begging, and I was, listening to all these people being, not, serious. (female, 60)

Other people around.

Other people around emerged as a subcategory of perceived barriers from the participant statements about the people who were near the participant during the pre-hospital period of the MI. Most often, there was a spouse around or contacted, but other family and people were also involved with the decision to seek emergency medical care. Unfortunately, having other people around prolonged the pre-hospital period and time to treatment of the MI.

Participants acted normal so as not to scare or alarm others. Three male participants completed their current activities without telling anyone there was a problem. This prolonged the pre-hospital period in each instance.

> “So this was New Year's Eve and I started feeling this pain in my upper chest—not even a pain, it was more like pressure. And I didn't want to uh alarm her. She's 86 [mom].” (male, 53)

> And my thought is if they see me like this, they are going to get scared. My thought was I gotta do something. . . . my thoughts were still that I got to get my girls organized. I got to get them out of here. I don’t want them worried about me, you know and what’s going on. (male, 44)

> I went over there and she was actually just getting ready to leave, because we have a brand-new granddaughter and she was going to go see the baby and stuff.

> And I walked in and I said "You know hey you know I don't want to panic anybody but I'm feeling this pressure in my chest I don't recognize. I haven't had this before. I need…I'd like to get it checked out." So she said, "Sure let's go." So I you know I laid down for a few minutes while she got ready. (male, 53)

The third participant stated he began having his MI symptoms at work.

> I didn't tell anybody there or anything. I just kind of—I was pretty much done. So I just kind of packed up, and told the lady that I was leaving and everything was done and everything and I left. And I went straight to the hotel. I was looking for a hospital or something at the same time. But I couldn't find anything so I just went to the hotel and told the lady there what was happening, checked out, and boom I was headed home. (male, 61)

Another participant's wife had him lie down and rest with the development of symptoms. It was their daughter that noted the participant didn't look so good sitting at the kitchen table short of breath. The participant recalled:

> And my daughter saw me. I was hanging my head you know, and breathing. She goes, "Mom you better take Dad the hospital." So I jumped up and said, "Yeah, let's go." Because we're just around the corner. . . . She [daughter] was watching me. She was the one that alert my wife to take me. "You better take Dad." (male, 52)

A participant living in a rural area developed MI symptoms at rest. Even though the participant's son suspected an MI, he drove the participant all the way into the city rather than calling EMS.

Another participant recognized her symptoms as cardiac in origin and made the decision to have her husband drive to the hospital. As she stated,

> So I made the decision, and my husband went along with it. We just notified them [grandkids] that we were leaving. That's it. We didn't call anybody. A matter of fact, we didn't call anybody until after I woke up from my surgery. That's when he called family. (female, 60)

Two participants called their wives from their vehicles while experiencing MI symptoms, but the wives didn't advise to call EMS or report to an ED as soon as possible.

> And I called my wife right away. And she says, "well you need to go and check yourself in." You know, "check yourself in to anywhere, anywhere, just go and check in." And I told my wife I felt the same way, "check yourself in right now. Get into a hospital or office, doctor's office or something." (male, 61)

> So, at that time, I just called my wife, and I said, "I think I'm having a heart attack." She says, "Just go to the emergency clinic. You'll be fine." Because I had been having these heartburns. I said, "No, I don't think this is gonna be one of

those times." And she started arguing with me – . . . . And she starts yelling at me. . . . We didn't know I was having a heart attack. (male, 57)

While some participants made a point not to alert people to their symptoms, one participant told his co-workers about his pain.

I told her. I said, "You know, I'm really having chest pains." I said, "I'm stressing out." And they thought it was a joke. They thought it was funny, and that's when I went home. . . . You can call this number and they investigate on it. And I told 'em, uh, when I told my supervisor that I was having chest pains, they didn't take me serious. . . And I told 'em it's really sad that I had that heart attack at home when it could have been prevented when I was here and I told his girl the symptoms that I was feeling. And they should have taken me to the emergency room and they didn't. (male, 57)

Category: Perceived Benefits

Perceived benefits are the beliefs and values of the advised action in reducing the perceived threat of an MI. It was apparent that participants had been educated about benefits of activating EMS during an MI following their experience. Four admitted they were not aware of the capabilities of EMS prior to their experience.

Well the only reason while [*sic*] I would call the doct---I mean the ambulance first is 'cause you know you're going to get the help right away. They have all the equipment to help you out. They [neighbors] don't, so that's I why I'd call the

> ambulance first. . . . They have everything for you there, everything you need. (male, 61)

> But it took my wife, I say, even though we're just down the road, we still got other kids at home she's had to situate them. She's getting dinner, so she had to get the dinner off the oven, or off the stove. . . . but at the time you're not thinking you're having a heart attack. So if I knew [I was] having heart attack, the cost wouldn't even run across my mind. I got to get an ambulance, I got to get in there. . . . I think if you could go in an ambulance and they can get to you. . . quickly and if you're having a major heart attack that's a benefit of ---what happens if your heart stops? (male, 44)

This participant realized the expertise and value of EMS if he was having a heart attack, but he didn't think his problem was an MI. Hence, cost prohibited this participant from activating EMS as he didn't think he needed the level of expertise provided by EMS. The same participant went on to explain further:

> So the experience that the EMS people can have in an ambulance could save your life so. . . . That would be---I think if somehow we could change the mindset of everybody, not just. . . But we don't think about the experience that the EMS people have and the professional that if they get you an ambulance they have the equipment to revive you or---if your heart attack gets to that point. 'Cause you

never know what your heart attack is gonna get to, if it's again, minor, mild, or major. You just don't know. (male, 44)

They [EMS] saved my dad. So. . . . We called. When my dad had a heart attack, I said – fell to the ground. I was in the Marine Corps. I was home on leave. I was giving him CPR. Um, when they came over there, they took over. They saved his life. (male, 57)

Two female participants summarized their thoughts about the benefits of using EMS in the following way:

Well, of course to have medical attention right away, at least something. . . . Well, to get there right away and to go to the hospital, I mean, to get to the hospital and to have some kind of medical attention while you're in – on the ride over there. (female, 48)

Never did I think that all I need to do is get on the ambulance, and they will start, with their EKGs and everything to see where, how they could help me. . . . Get to the hospital, which I didn't have, getting to the hospital myself. (female, 60)

The most commonly cited benefits were obtaining medical attention right away en route to the hospital.

Category: Learned Behavior

Each participant was asked what they would do if they experienced MI symptoms again. There were a few commonly stated responses from the participants: a) drive myself, b) have someone drive to the hospital, c) call EMS if I am alone and cannot drive myself, and d) call EMS.

> I might've called 9-1-1, it all depends. I think I would've made it myself. I would've got my neighbor to take me. . . . I would drive to the hospital, since I live close by. If somebody was here I would [have them drive me]. I could drive myself. As long as it wasn't a very chronic pain, like I said. As long as it was just stinging little---a constant stinging. And of course if my breath--- If I started getting short of breath, I would know to go. Because it's not worth taking a chance. (male, 52)

During the interviews, in response to the things participants might do differently next time, their initial response was to call EMS. However, as participants continued to talk, it was often revealed that they would drive themselves if they could, or have someone drive them to the hospital. Participants would only call EMS if they were alone and having symptoms too severe to drive themselves to the hospital.

> I try to find help as fast as I can. If I can, I drive to the hospital right away. Or if I can't---- I got my family on my land. Somebody is there all the time, I look for help right there. . . . Only if I cannot drive, then maybe you know, I call the ambulance. (male, 65)

Once I take that medication twice, a third time, if it does not [*sic*] working that's when you call the ambulance. That's what he told me. . . . But I mean if I get chest pain, I'm going to the hospital, you know. I'm not going to wait for that thing to work or not. I mean as soon as I feel it, I'm gonna take that, but I'm going straight to the hospital. I don't care if it's the first time or the second time. I mean, the very first time I know I'm gone, because I know there's something wrong. . . . I'd drive if I could. If I can. If I can't, then of course I have to call the ambulance. . . . (male, 61)

I would have actually called 9-1-1, because that's what I've been instructed to do. Just because I already have two stents and the third one put in. Wherever I'm at, I need to call 9-1-1 and. . . . I've been told, but I've learned that I guess the situation depends. I mean if---I know I won't be able to drive, drive myself. 'Cause again if I get in a car, and I was able to relax, but if I get into a car and relaxxxxx driving, you could pass out and cause an accident or something. But if you have somebody that can--- drive you there, and you're still close enough you might think you would still do that. Now if you're in your own, you would definitely have to call 9-1-1, by the time someone could actually get to you versus I had someone there that I could call, my wife. . . I think I would have to call 9-1-1. But if I was in the same situation where I was at soccer practice, or people around, somebody could actually drive me there. Yeah, but my thought now is if I'm by myself, I know I

need to call 9-1-1. Now I have that process thought out. If I'm by myself, I got to call 9-1-1. (male, 44)

If I didn't have a ride to get there, then if I felt like I was – needed to go, then I would go. If I wouldn't have had a ride, I would have called an ambulance." I'll catch a ride, no, ambulance, ambulance. The first time I caught the ride, the second time – second two times, ambulance--because I was in the hospital, I mean I was at my doctor's office and they called the hospital – the ambulance for me. (female, 48)

Each participant was then asked what they would do if a friend or family member was experiencing the same symptoms they experienced. Questions were asked in this order so that each participant had time to talk about their own experience and reflect on it, as anything they learned from their own experience would be expected to be put into action for a friend or family member. Participants responded with similar answers in their treatment of friends and family as they did to their intentions for themselves. A number of participants stated they would drive the person to the hospital or strongly encourage the person to see a doctor soon.

"Yeah I'd tell them, "come on, I'll drive you." (male, 53)

Well, I think the first thing I do is ask him, "What do you feel?" If whatever he feels is similar to what I feel when I got sick, I just try to help him right away. By

taking him to the hospital or calling the ambulance. I try to help him. . . . I mean this is in case that person don't [*sic*] have anything else, nobody else, no car. (male, 65)

I would say -- Either I take you or you want me to call an ambulance? And you want them to make, that decision. . . I think you need to be straightforward with them, and say, "Hey, you could be having a heart attack. I've had those feelings before. I've been there, and if you don't go now. . ." I say "Let me drive you to the hospital. I'm already here. Unless you want an ambulance to come get you." (male, 44)

– I'd take her to the hospital or I'd have them call the ambulance. Whichever way they want, because if I see somebody's that hurting like that and they tell me how they felt and – it felt like I used to feel it, then I'd tell them, "Well this is how I felt when –" . . . . Either that or I'd have her call her doctor or the nurse and tell her what's going on and if they say to take her in, well then I'd take her in. (female, 50)

Some participants had very clear ideas about contacting paramedics and even initiating cardiopulmonary resuscitation (CPR) if needed for their friend or family member in their potential scenario.

I'm to where I can carry my wife in my truck and take her in. If, my wife falls down to the ground, yes, I'm calling 9-1-1 because I know how to give her CPR. I know how to –do whatever I need to do. And I would call – if she was on the ground, that's when I'd be calling the ambulance. – because I'm not gonna be wasting my time driving when I could be, giving her CPR. (male, 57)

I would say call an ambulance, try to do CPR. I know that helps for the heart attack, . . . Yeah, I would try it because– I've been trained to do CPR at work. (male, 67)

"I wouldn't recommend them to take a car. . . . Because, what about if something happens to them on the road? Something can happen; it ain't worth it, so." (female, 58)

For myself or for any, a friend or anything. I wouldn't hesitate. I wouldn't take the chance again of going like that [in a car]. (female, 60)

Anybody starts complaining about chest pain or anything like that I tell them, "Don't take a chance, go see the doctor." I say, "You never know what it is." "Well, I think it's indigestion" and I said, "That's what I thought." I said, "Believe me I had blockage 98%." I said, "If I were to have waited any longer, I could be

dead." I said, "The same thing can be happening to you. " I kind of scare them. I tell them, "The same thing could be happening to you, you know. You need to get checked." (male, 61)

I tell everybody, I'm like a spokesperson now for it. I'll talk to –my family will come over. I said, well, you need to go check it out. Make sure y'all get checked for it. If it's, uh, indigestion or whatever, make sure you get checked for it because you never know. . . . Tell them to go to the doctor right away, as soon as possible. . . . Oh, if it was really bad, I would call – call an ambulance if I had to. (female, 48)

Other participants had intentions to make changes to their preparedness for another MI.

"Yeah, they gave me the aspirin. I always carry aspirin with me. Uh, aspirin, I mean they're just right there." (female, 48)

My biggest thing---we got to get you to the hospital soon as we can. If I had a first aid kit on me, or if I had a chance to go in a convenience store and grab some aspirin. I'd say take a couple of aspirin and let's go. That would probably be the thing to do. . . . just keep a bottle of Bayer aspirin or baby aspirin in your glove compartment. But as a normal person, if you haven't had that heart attack, "Why do I need that aspirin in my glove compartment?" You don't have that thought,

because you've never gone through it. Now that I do, I mean, I know. Then again, I still haven't kept a bottle of aspirin my car. (male, 44)

"I don't carry them [nitro] with me, I don't! But I am going to start putting them on my medicine thing…" (male, 61)

Three participants stated their opinion about gender difference related to the MI experience.

"We need to go. Don't mess with it." I was lucky that I had a couple of parents there that say, "Hey take aspirin, hey call your wife." "Oh really? I need to go?" You know, because guys I guess we can get into being stubborn. We don't---the more we're told "don't do it," the more we do it. That's a guy thing. (male, 44)

I was slowing down real fast. Well, my cardiologist [*sic*] says, "That was your congestive heart failure. You should have caught on to it." He says, "Women don't pay attention to those kind of things to their bodies." He says, "You were in congestive heart failure at the time." So I didn't listen to my body. But thinking back now, I see it. (female, 60)

. . . women don't react to the heart attacks like men do. Usually they say that women– don't have it [heart attack] that way like men do for some reason. What I learned is that men have different, heart attack, symptoms or they –have different

> symptoms than women do. . . . be very careful and to go to the doctor and make sure that they, uh, are checked because I didn't even know I had a heart attack. – it can be overlooked. (female, 48)

Summary

Out of the 12 participant interviews, the overall theme was degree of perceived threat leads to action. The overall theme consisted of five categories: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and learned behavior. Perceived susceptibility had different interrelated layers and consisted of three subcategories: a) heart health (pro-heart health and con-heart health, b) risk factors, c) and MI symptoms (Figure 2). MI symptoms included actual symptoms, expected symptoms, and the degree of congruence between the two. The larger the degree of incongruence was, the more that was a barrier to initiating emergency care during the MI. Perceived severity was a small but distinct category. There were several participants which received the message from their HCPs they had little to no permanent damage from the MI. Others realized they were quite fortunate to have survived an MI and felt a spiritual component in their survival or the MI was a warning sign. Perceived barriers consisted of six subcategories: a) my way, b) HCP barriers, c) health care access, d) inappropriate action, e) clock ticking, and f) other people around. Barriers ranged from those perceived within the individual to much larger physical barriers like transportation (Figure 3). Recent interactions with HCPs posed a barrier to the participant's perceived susceptibility and this combination logically leads to decreased initiation of emergency

services for MI. Perceived benefits of the desired action (initiation of emergency care) made it clear a number of participants had learned about the benefits of using EMS to obtain rapid treatment of MI symptoms. Learned behavior differentiated what the participant would do if they developed MI symptoms in the future versus what they would do for a friend or family member in the same position. The rapid response of a number of participants was to call 9-1-1 to activate EMS. A number of participants said they would call EMS if they had MI symptoms again, but then the majority of participants stated they would do this as a last resort if they were alone.

“Susceptibility + severity = threat or ‘readiness to take action.’
Benefits – barriers = possibility of threat reduction.”

Chapter 5: Summary, Conclusions, and Recommendations

This chapter presents a discussion of the research findings, strengths and limitations of the findings, and the findings as they relate to implications for theory, practice, education, research, and health policy. The findings will be presented by the five categories that emerged from the data. Next the limitations of the study are presented followed by a discussion of the study conclusions. Finally, the implications for nursing practice, theory, and research are recommended according to the research findings. First, the perceived susceptibility of participants to a myocardial infarction (MI) is discussed taking risk factors and MI symptoms into account. Second, perceived severity is discussed including the participants interpretation of their MI severity and their emotional response in the pre-hospital period. Third, perceived barriers are discussed to include participants' sense of control, health care provider (HCP) barriers, transportation, inappropriate action/self-efficacy, the ticking clock, and other people around the MI victim. Fourth, perceived benefits of activating emergency medical services (EMS) during an MI are presented. Finally, learned behavior in the event of repeating symptoms and also being in the proximity of a friend or family member experiencing MI symptoms is reported on as these responses tell us about future intentions.

The aim of this study was to describe the experiences of Mexican American adults in seeking emergency care including EMS activation during acute MI. The research question to be addressed in this study: What are the influencing factors that affect Mexican American adults' decision to seek emergency care including EMS

activation during an acute MI? Research studies that have Hispanic populations as well as other ethnic groups are used in this discussion of conclusions, because there are limited studies with Mexican American samples.

Discussion of Categories

Five categories emerged from the interviews with participants. The categories, which overlapped in several ways included: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and learned behavior. The categories made up the overall theme, degree of perceived threat leads to action.

Category: Perceived Susceptibility

Heart health.

It was apparent that participants had spent some time thinking about how and why they had their MI. Whether it was somewhat expected (family history) or unexpected (otherwise generally healthy), each participant had spent time mentally processing their MI experience. Some participants had come to terms with the MI that had occurred, but others felt their lifestyle and behavior had not warranted such an event.

Eleven of these participants had low perceived susceptibility to an MI which contributed to the complexity of their decision-making process to initiate emergency care. One participant had experienced a prior cardiac event, so his perceived susceptibility to an MI was higher than the other participants. The risk perception of these participants was low because they didn't fit their own concept of people that had heart attacks, had recently had a health check-up that was unremarkable, or perceived few health vices. The

study findings regarding misperception of personal risk to MI were similar to previous research findings (Avis et al., 1989; Christian et al., 2007; Finnegan et al., 2000; Harralson, 2007). Arslanlan-Engoren (2007) found women believed cardiovascular disease (CVD) was something obese, stressed, cigarette smoking men got. Finnegan et al. (2000) found similar stereotypes among men and women. Many women still do not realize CVD is the primary cause of death among both men and women (Mosca et al., 2010). Through their thorough review of the literature, Jensen and Moser (2008) summarized that perceived susceptibility to a cardiac event is vital in initiating healthy changes in lifestyle and seeking emergency care immediately upon experiencing MI symptoms, though this concept is also outlined by Janz and Becker (1984) in the Health Belief Model (HBM).

Pro-heart health.

Participants with a low perception of their risk for MI (n = 8) perceived themselves to be relatively healthy and often compared themselves to others with obesity, alcohol and drug use, fatty diet, and sometimes people that smoked cigarettes. Participants cited they were losing weight, quit doing drugs, didn't smoke as much as previously, saw a doctor regularly, and were trying to keep stress down, among other things.

With little to no significant health history, half of all the participants (n = 6) considered themselves fairly healthy with no heart issues. During the interview, participants would reveal habits that were detrimental to heart health (e.g. smoking, poor diet, lack of exercise). Additionally, 58% of participants would be classified as obese

(e.g. body metabolic index $\geq$ 30.0 kg/m$^{2)}$, which is a risk factor for MI. Eight participants exhibited comparative optimism thinking they had better health and less risk of MI than similar people; comparative optimism is well documented among individuals at moderate to high risk of cardiovascular-related diseases and events such as MI (Avis et al., 1989; Barnhart et al., 2009; Peterson, Helweg-Larsen, Volpp, & Kimmel, 2012; van der Weijden et al., 2007; Wright et al., 2010). Specifically, Wright and colleagues (2010) found 63.0% of Hispanic participants underestimated their health risk compared to 23.3% of non-Hispanic Blacks and 13.7% of non-Hispanic Whites.

When the symptoms experienced by two participants dissipated, they returned quickly to their previous self-perceptions that they lived a comparatively healthy lifestyle. Participants with a high pro-heart health outlook had a high threshold of sorts for allowing themselves to fathom they were experiencing an MI. Participants also thought a life of hard work would somehow act to decrease their susceptibility to an MI, but hard work is not synonymous with aerobic exercise. Perhaps participants thought their ability to work hard was confirmation of their positive cardiac health. Six participants had recently (within two months) been to the doctor and felt confident they were healthy with low perceived MI risk, as did the participants in Finnegan's (2000) study. However, this finding of low perceived MI risk after a recent doctor visit was not found elsewhere. Nymark and colleagues (2013) reported one of their themes in studying emotions that delay care-seeking in MI was fear of losing a healthy identity, but the Mexican American participants in this study did not directly state such fear. Pattenden and colleagues (2002)

found similar findings to this study with participants in their qualitative study of 22 individuals with multiple MIs with low perceived risk reported taking longer to evaluate their symptoms and seek emergency care.

Con-heart health.

Participants (n = 8) reported having a lack of a nutritious diet, lack of exercise, weight gain, and family history of an MI. The statements in this meaning unit were made by participants late in each interview as they got around to talking about the concepts. Though participants each had multiple risk factors, they didn't readily integrate these into their idea of perceived susceptibility to an MI, similar to the findings of Homko and colleagues (2008) and Broadbent and colleagues (2006) regarding perception of future risk for cardiovascular disease and MI respectively.

While several of the topics discussed by participants in relationship to con-heart health perceptions were in line with what other researchers have found, a marked difference between this group of participants and other study findings was the nearly complete absence of a discussion of fatalism. There was one participant that was an exception, as this participant was feeling a lack of control over his cardiac health after his cardiac issues, an MI, and the three family members that died of massive MIs by the time they were just a few years older than the participant. Fatalism is a characteristic often associated with the Mexican American population, but found among non-Hispanic populations as well (Christian et al., 2007; Larkey et al., 2001; Mosca et al., 2006; Murray et al., 2000; Roncancio et al., 2011; Warda, 2000). Though this group of

participants lacked the fatalism associated with Mexican Americans, they spoke of a number of con-heart health perceptions under the subcategory of heart health.

Risk factors.

Risk factors were a subcategory under perceived susceptibility. Though each participant in the sample spoke at length about risk factors, the risk factors for MI may have been part of their patient education in the hospital and post-MI while following up in their respective cardiology clinic. The typical layperson does not know all the risk factors for an MI and this lack of knowledge contributes to a low perceived susceptibility to MI (Christian et al., 2007; Homko et al, 2008; Larkey et al., 2001; Mosca et al., 2006). Initially risk factor meaning units were separated into low perceived risk for the positive heart healthy behaviors participants had and the high perceived risk meaning units. There were few participant statements that fell under the low perceived risk factors.

There was not a formal scale to measure perceived risk in this qualitative study, but from multiple statements from each participant, seven (58%) had low perceived susceptibility to MI based on their perceived risk factors. This percentage of low perceived susceptibility to MI is greater than Frijling and colleagues (2004) who reported 30% of participants underestimated their risk of MI similar to Avis and colleagues (1989) at about 40%. This sample's participants stated they didn't have these risk factors, so the mental perceived susceptibility may decrease. Participants reported that they don't eat *that* bad or they have *decreased* their smoking. The participants in their forties remarked that they were not old enough to have an MI. Eleven participants failed to cite their

existing co-morbidities such as hypertension, hyperlipidemia, and diabetes as risk factors. There was one participant that spoke of her untreated hypertension, but she was the only one that voiced the connection between hypertension and MI. Though each participant had multiple risk factors for an MI, similar to Homko and colleagues (2008) findings, participants in this study did not perceive their high risk of CVD. Participants' perception of being too young to have an MI is similar to that reported by male participants in Finnegan's (2000) study. Participants made a point to list the risk factors they did **not** have. This is directly related to the participant's perceived susceptibility to MI and an individual's desire to underestimate their risk for an MI.

Participants relayed an understanding of several modifiable risk factors: a) diet, b) weight, c) exercise, d) cigarette smoking, e) alcohol and drug use, f) stress, and g) hypertension. Similar to the findings of this study, Webster and Heeley's (2010) literature review stated that among qualitative research findings, stress, smoking, and family history (non-modifiable) were perceived as participants most notable risk factors. This sample's perceived risk increased similarly to that found in other studies in regard to smoking (Avis et al., 1989; Finnegan et al., 2000; van der Weijden et al., 2007), stress (Murray, Manktelow, & Clifford, 2000; Perkins-Porras, Whitehead, Strike, & Steptoe, 2008), and obesity (Alwan et al., 2009; van der Weijden et al., 2007). However, this sample was different from other studies in risk perception (Frijling et al., 2004; Meischke et al., 2000; van der Weijden et al., 2007) in that 66% of the sample had a diagnosis of hypertension, but only one individual cited hypertension as a factor that increased her

perceived risk for MI. Alcohol and drug use as a risk factor for MI was noted to be similar as that reported by van der Weijden et al. (2007) in that it is measured and mentioned, but not found to be a significant factor. There was only one participant for which alcohol and illegal drugs were notable as he had a significant history, however this was not a prominent risk factor reported in studies for MI or CVD.

Male participants in this study spoke about their diet, weight, and exercise at some point during the interview. Conversely, four women spoke about diet, two spoke about weight, and one spoke about exercise with only one of these women speaking to all three modifiable risk factors. So participants reported an understanding of the elements of a 'healthy diet' and were able to identify ways that their personal diet did not conform to those recommendations (e.g. high saturated fat, large portions, low fruit and vegetable intake). Several participants stated their thoughts that the typical Mexican diet was not the healthiest. The risk factors among participants were closely interlinked as the diet high in saturated fats and low in nutrients was linked to weight gain and an increasingly sedentary lifestyle. Similarly, Barnhart and colleagues (2009) found interrelated concepts wherein participants had an increased risk perception for coronary heart disease (CHD) in the presence of obesity, low levels of physical activity, and a self-identified need to see a nutritionist. Also similar to this sample, increased levels of perceived risk of CVD development were reported by Allen et al. (2010) among participants with modifiable risk factors of a diet high in fat and by Alwan et al. (2009) among overweight participants.

The Mayo Clinic cites stress as a modifiable risk factor for MI (2013). The stress of multiple jobs over the years can take a toll on heart health as stress is a risk factor for MI. Of the eight male participants, seven worked at least full-time at the time of (and after) their MI. Of those seven, four worked a full-time job plus at least one other job. Each of the male participants had no change in their job roles and extent of work after their MI. Nine participants (75%) had life issues and work quality/quantity that were posing high levels of stress in their lives. Over time, this stress can contribute to a chronically high allostatic load, which contributes to high blood pressure, and is a risk factor for CVD and MI (Barr, 2008). So having multiple jobs and poor job satisfaction and/or high jobs stress may have contributed to increased risk factors in these participants. Some (n = 7) of the sample spoke about the need to grab quick convenient (calorie dense) foods and little time for exercise as a result of their work schedules. These modifiable risk factors were stated by the participants later in the interviews without probing questions.

All in the family.

The non-modifiable risk factor of a family history of MI was so prevalent among this sample, a separate meaning unit cluster was needed within the risk factors subcategory. Nine participants (75%) had family members that had experienced an MI. The father of seven (58%) participants had experienced an MI, but no mothers. This non-modifiable risk factor was a sobering reality for participants, but it really had not changed their perceived susceptibility until being hit with their own MI experience. A few

participants hadn't thought of who had experienced an MI in their family much until the probing questions of the interview asking participants to tally relations. Four participants did not require probing questions to speak about family members that had experienced an MI, and participants spoke about the experience and symptoms of family members briefly. Kirchberger et al. (2012) reported a family history of MI was associated with participants positively identifying symptoms as cardiac in origin. Four participants in this sample with a family history of MI had a pre-hospital delay of > 2 hours. Similarly, Kirchberger and colleagues also report participants with a family history of MI were significantly more likely to have a prolonged pre-hospital delay of > 2 hours. Unlike this sample, Finnegan et al. (2000) found a family history of MI, especially in parents, increased perceived susceptibility. Several studies have reported a family history of MI increases a person's perceived risk to MI (Avis et al., 1989; Frijling et al., 2004; Meischke et al., 2000).

This sample's participants had a low perception of risk for MI despite their family history for numerous reasons thinking they were too young, didn't have many health issues, had just seen their physician, and that their health habits were not *that* bad compared to other people. Experiencing their own MI led to participants seeing their family health history in a different light and asking questions such as how old so-and-so was when they had an MI. Some of the participants experienced a reality of their own, as their own MI was not fatal while that of a close family member had been fatal. They pondered their own mortality and what was different about their experience. In several

instances, participants described MI symptoms that were much different from those that a family member had felt and stated how this contributed to their pre-hospital delay.

MI symptoms.

Chest pain is the most common MI symptom and the most well-known among the public. In this study, seven (58%) individuals reported experiencing chest pain. Studies report quite a range of participants that experience chest pain/pressure during their MI at 61% to 90% (Deshmukh et al., 2011; Dunlap & Fox-Wasylyshyn, 2011; Meshack et al., 1998).

When people experience MI symptoms, it is a stressful time in which they must determine the meaning of these physical sensations and use that information in their decision-making process. Only 33% (n = 4) of these participants thought their symptoms were cardiac in origin eventually during the pre-hospital period. Three of these four participants sought emergency care within two hours of symptoms onset. Similarly, Lesneski (2010) reported when people experience high levels of pain and think symptoms are cardiac related, treatment delays are relatively short. Similar to this sample, Deshmukh and colleagues (2011) reported 41% of Hispanics attributed their symptoms to a cardiac origin among 36 Hispanics (Puerto Rican and Mexican). Studies of other populations report 36.5% to 53.3% of participants attribute their symptoms to a cardiac origin (Dunlap & Fox-Wasylyshyn, 2011; Gouveia, Victor, & de Lima, 2011; Kirchberger, Heier, Wende, von Scheidt, & Meisinger, 2012). The remaining participants

(n = 8) in this sample did not experience the crushing chest pain generally expected by people.

In response to the common cinematic depiction of what a heart attack looks like, people have come to expect sudden, severe and debilitating chest pain (Finnegan et al., 2000; King & McGuire, 2007; O'Donnell & Moser, 2012). Eight participants (67%) in this study spoke specifically of this expectation of an MI presentation (one does not remember the MI as he was sedated for dental work). Symptom congruence with previous expectations is a strong predictor of short pre-hospital delay (Fox-Wasylyshyn et al., 2010, King & McGuire, 2007; Nymark, Mattiasson, Henriksson, & Kiessling, 2009; Quinn, 2005). Dunlop and Fox-Wasylyshyn (2011) found symptom congruence and a history of coronary artery disease explained nearly 18% of the variance of an individual attributing their physical sensations as related to cardiac function (e.g. an MI).

Seven people (58%) in this study experienced symptom incongruence and thought their symptoms were not at all like they expected an MI to feel like. Like Finnegan and colleagues (2000) reported, participants did not experience symptoms severe enough to cause debilitation, and the MI also wasn't the Hollywood drama these participants expected. This study was similar to that of Zerwic and colleagues (2003) in that half the women experienced symptom incongruence. Three quarters (n = 6) of the men in this study experienced symptom incongruence, while only about half of Zerwic's male participants experienced symptom incongruence.

Participants in this study frequently attributed their symptoms to a non-cardiac origin (n = 8) with gastrointestinal issues (heartburn) being most cited. Other research studies have reported participants often attributed their MI symptoms to non-cardiac origins such as the gastrointestinal system, musculoskeletal system, respiratory system, or stroke (Deshmukh et al., 2011; Gouveia et al., 2011; Henriksson, Lindahl, & Larsson, 2007; MacInnes, 2006). Research has reported 25% to 75% of participants have attributed their symptoms to non-cardiac origins (Moser et al., 2005; Perkins-Porras et al., 2009; Thuresson, Jarlöv, Lindahl, Svensson, Zedigh, & Herlitz, 2007).

The study participants attributing their symptoms to a non-cardiac origin has significant consequences. Failure to attribute MI symptoms to their cardiac origin has been associated with a delay in decision-making and prolonged pre-hospital delay and initiation of medical care (Banks & Dracup, 2006; Finnegan et al., 2000; Fox-Wasylyshyn, El-Masri, & Artinian, 2010; Gärtner et al., 2008; McKinley, Moser, & Dracup, 2000; Perkins-Porras et al., 2009; Zerwic et al., 2003). Though a lack of perception of the cardiac origin of symptoms may psychologically protect perceived MI susceptibility (Avis et al., 1989), prolonged pre-hospital delay can increase morbidity and mortality (American Heart Association [AHA], 2005; De Luca et al., 2004; Rosamond et al., 2008).

When participants' actual symptoms didn't meet their expectations, the incongruence led to increased hospital delay and lack of urgency in the cardiac event occurring. Participants used precious time to try self-treatment of their symptoms. When

self-treatment failed, participants reevaluated the situation and eventually sought medical care. Similar to this sample, participants in Finnegan's (2000) focus groups reported self-treatment prior to seeking medical care. Nymark and colleagues (2009) completed focus-group interviews and also reported similar findings to this sample with an entire sub-theme of avoidance and coping strategies to counteract the health threat. Also similar to Nymark and colleagues' findings, when self-treatment failed, these participants reevaluated their symptoms and often reached what Nymark and colleagues termed the "turning point" when care turned from self-regulatory to health care seeking behavior. Finnegan and colleagues (2000) and MacInnes (2006) reported similar reevaluation results once self-treatment efforts fail. Each participant in this sample attempted some degree of self-treatment with reevaluation of status, and seeking medical care eventually. Participants made decisions to drive themselves or have family members drive them to the hospital when they may not have if they realized the origin of their symptoms was actually cardiac and due to an MI.

These participants with symptom incongruence, experienced what was once termed atypical symptoms (AHA, 2010; Tullmann et al., 2007); however, a newer and more descriptive term is a slow-onset MI (O'Donnell & Moser, 2012). Slow-onset MI characteristics involve a gradual onset of any MI symptoms which are intermittent and may gradually intensify (O'Donnell & Moser, 2012). Symptom incongruence is often experienced with a slow-onset MI, so participants delay seeking care and may cope and self-treat at home (O'Donnell & Moser, 2012).

Correct interpretation of the origin of symptoms is important because correct interpretation of a cardiac origin is one of the most powerful factors associated with a shorter pre-hospital delay and therefore less mortality and morbidity (Gouveia et al., 2011; Kirchberger, Heier, Wende, von Scheidt, & Meisinger, 2012; McSweeney, Lefler, Fischer, Naylor, & Evans, 2007; Quinn, 2005). Four participants (33%) attributed their symptoms to the heart with one reaching the hospital in 15 minutes and another arriving 60 to 90 minutes after the onset of his symptoms. The third participant waited two hours before her son took charge and called EMS, and the fourth participant had fast-onset symptoms that resolved eventually and was not assessed by a physician for three days. This fourth participant simply thought he had blockage, as he had experienced this in the past prior to cardiac stenting. These four participants were different in that their description of symptoms was what O'Donnell and Moser (2012) call fast-onset MI with sudden, severe, and continuous chest pain being the defining characteristics. Fast-onset MI is the dramatic MI people expect (based on cinematic portrayals), so there is symptom congruence, and often a short pre-hospital delay (less than two to three hours) as individuals perceive the severity of the symptoms.

Category: Perceived Severity

These participants often didn't comprehend the potential risk and severity of their symptoms, so they didn't immediately seek emergency care. Eight (66%) participants didn't recognize their symptoms as being cardiac in origin, let alone an MI. Participants attempted self-treatment and when that didn't help, they began to realize there was a high

risk to their health and sought help, similar to findings reported by Galdas and colleagues (2010). It wasn't so much the symptoms and discomfort to the body, but the realization of the high health risk that motivated these participants to seek health care.

Eight participants were anxious and fearful of potentially dying due to their unknown symptoms that wouldn't cease and went to the hospital within two to three hours (plus EMS was called for the sedated participant within 15 minutes) with similar emotions and thoughts reported in other studies (McKinley et al., 2004; Morgan, 2005; Moser et al., 2005; Nymark et al., 2009). Larkey and colleagues (2001) worked with Arizona Hispanics and found the most significant factor by far influencing participants in going to the doctor was the perception of the seriousness of symptoms ($p = .0001$) similar to this sample. Kirchberger and colleagues (2012) studied 2,243 MI victims and reported fear of death was associated with the correct symptom origin attribution, but fear of death was not associated with pre-hospital delay time which was not consistent with what participants in this sample stated. While perceived severity of unrelieved symptoms was the primary reason for seeking medical care in this sample, a somewhat different order of findings was reported by Henriksson and colleagues (2011); Henriksson et al. found MI victims went to the hospital most for relief of their pain, but the second most common reason was perceived severity of the symptoms. Unlike this sample, Nymark and colleagues (2013) did not find this fear of death propelling MI victims to seek immediate health care, but found participants fairly incapable of making a timely decision to seek medical care.

Nine of these participants sought medical care within two to three hours of symptom onset, which is a high portion of the sample and may be due to the perceived severity that something was very wrong, even if participants did not realize the cardiac origin or MI. Similarly, McKinley et al. (2004) reported participants that perceive the severity of their symptoms have a significantly short pre-hospital delay time compared to participants unaware of symptoms severity. Like this study, Kaur and colleagues' (2006) qualitative study of people that experienced an MI reported the category becoming aware of the threat; the threat to life and severity of the symptoms was not always apparent to participants, but emerged over the pre-hospital period.

With fast-onset MI symptoms, severity is quite apparent as it was for three of the four participants that experienced fast-onset characteristics. There is cardiac origin attribution, perceived severity, and worry generally propels action in the way of seeking help like it did for the woman that woke up knowing she was having an MI.

For the eight participants that experienced slow-onset MI symptoms, there was no cardiac attribution for the vague symptoms. Similarly, another study reported over two thirds of participants thought the MI symptoms they experienced were moderately serious to not at all serious (Johansson, Stromberg, & Swahn, 2004; Lesneski, 2010). Klingler and colleagues (2002) reported 20% to 35% of their participants perceived their MI symptoms as unimportant and Morgan (2005) reported 43% had mild symptoms. Each of this sample's participants tried multiple self-treatments to no avail. When the severity of MI symptoms is not perceived, the pre-hospital delay increases (Leslie, Urie, Hooper,

McKinley et al., 2004; Morrison, 2000; Moser et al., 2005). Eventually after failed self-treatments, these participants sought medical care. At that point, their perceived severity was elevated, because self-treatments that worked in the past now failed.

Interestingly, of the married participants (n = 9), all but one spoke about the fear and potential loss for their spouse if they were to die. Three participants had to pause on this topic to regain composure and continue with the interview. The one married participant that didn't speak to this had his symptoms three days before he went to see the doctor and he had a cardiac history (stents), so there were not huge surprises for he and his wife. One of the unmarried participants that knew her symptoms were of cardiac origin had explained the anger and fear of her son that thought she was having an MI and called EMS. Though the participant had dealt with their own decision-making process in the pre-hospital period, it was the time that the decision was already made to seek care that was the most fearful for six spouses. Perhaps that's when the potential severity of the experience en route to the hospital or prior to diagnostic procedure came to a peak for some. Similarly, Johansson and colleagues (2004) also reported fear was evident when the participant decided to go to the hospital.

Three participants specifically spoke to their religious beliefs as a coping mechanism through the time of their MI. This study's findings were similar to Finnegan and colleagues (2000), who reported the use of religion as a coping mechanism among Hispanics and African Americans.

Another concept that emerged from the data was that the MI was a wake-up call to make the change to a healthier lifestyle with better diet, weight loss, exercise, decrease stress, and be happy that participants have the opportunity for a second chance of sorts. This could be viewed as a meaning unit from beyond the pre-hospital period, so it was not something that was prevalent in the pre-hospital literature. However, the concept of a wake-up call was important in that five participants specifically spoke to it. In addition, eleven participants cited the lifestyle changes they had made toward better health since the MI, similar to Finnegan's findings (2000).

Three participants interpreted what their doctor said as a lack of harm to the heart, but every participant had an MI. What does this communicate to the participant about the severity of an MI? Does this affect lifestyle choices? In what way? What the physician actually said versus what the patient heard, may be two different things, but there were no means of definitely knowing through this study. The messages we send to patients with our words as HCPs need to be chosen very carefully, and there are nursing practice implications to consider in light of these participant interview findings. This finding of the HCPs stating there was no damage to the heart was not found in the literature.

Category: Perceived Barriers

The perceived barriers category was simply fascinating to analyze, because there were so many interesting and unexpected layers. Before the interviews, I never expected such a repeated variety of barriers to emergency care and calling EMS. As Lesneski

(2010) states a pre-hospital delay is anything but dialing EMS while experiencing MI symptoms or suspected symptoms.

My way.

Retaining control over the situation and not relinquishing control to health care providers were apparent issues for three of the women and three men experiencing their MI. Three of these participants were not at home when their symptoms began and wanted to return home for self-treatment, just as Pattenden and colleagues (2002) reported among participants. This is behavior considered to be stereotypically masculine wherein men will only seek help when the activities and work required to earn a living are affected (Sobralske & Katz, 2005). Similar to this sample, individuals who think they are in control of their MI symptoms have had extended pre-hospital delay during an MI (Lesneski, 2010; Pattenden, Watt, Lewin, & Stanford, 2002). However, as this sample revealed, such a desire to retain control over the MI experience is not purely found among men (Galdas, Johnson, Percy, & Ratner, 2010). Galdas and colleagues completed their research in Canada and the ethnicity of the participants was not disclosed. The Mexican American descent of the participants may be a factor in the desire to retain control over the situation and may promote pre-hospital delay. Note there was not a gender binary among these participants in this subcategory with traditional male and female behaviors about health, health-seeking, and symptoms including pain (Galdas et al., 2010).

Recall four participants spoke specifically about their pain and discomfort and how they knew how much they could take. Inner control and endurance of pain are highly valued characteristics in the Mexican culture (Sobralske & Katz, 2005; Villarruel, 1995). Villarruel and Ortiz de Montellano's work (as cited in Sobralske & Katz, 2005, p. 345) stated that "Mexican Americans endure illness and pain as a sign of strength and do not seek help until it becomes unbearable." Sobralske and Katz go on to state that pain is an influencing factor to seek medical care, so that one can continue to do the work it takes to be a man. Zoucha and Purnell state (as cited in Sobralske & Katz, 2005) women may assume the same stoicism as men when faced with pain and simply hope for the pain to go away. With this in mind, a slow-onset MI will likely not impair work and daily responsibilities. What may be a long pre-hospital delay already with vague MI presentation may be even longer with Mexican American cultural characteristics driving people on to work through the pain.

For these four participants trying to endure pain, there is a pride and imperviousness associated with enduring pain stoically and continuing to work through pain similar to that reported by Villarruel. Villarruel (1995) describes pain as something Mexican-Americans view as having the self-efficacy to accept, deal with, and overcome. Villarruel also reports failing to maintain this stoicism and work through pain is viewed as weak in the Mexican American culture.

Sample participants with slow-onset MI characteristics did not think their vague and relatively minor symptoms made them sick enough to need an ambulance, which has

been reported in previous studies (Finnegan et al., 2000; O'Donnell & Moser, 2012). Like other studies, the decision-making and health-seeking process were found to be a complicated interaction of knowledge, previous experience, perceived risk, individual beliefs, emotions, and the circumstances of the MI event (Galdas et al., 2010; Nymark et al., 2009; Pattenden et al., 2002).

There was a common perception among this sample that traveling to the hospital via a privately owned vehicle is more rapid than an ambulance. Finnegan and colleagues (2000) reported similar findings from their national focus groups. Hutchings and colleagues (2004) actually studied this issue in the Rapid Early Action for Coronary Treatment (REACT) trial across 20 U.S. cities, and researchers reported private transportation was a few minutes faster than EMS. However, EMS initiates emergency care and can help in avoiding sudden death, which is a benefit over the use of private transportation which this sample did not realize similar to findings reported in other studies (Finnegan et al., 2000; Hutchings et al., 2004).

HCP barriers.

This subcategory was a surprise in that most people may think some of these items, but not necessarily voice them to health care professionals. I felt privileged that participants were so candid with me and shared their personal thoughts.

Two female participants went to their primary care physicians with complaints of symptoms that were actually cardiac in origin that went unrecognized by the physicians. The emergency room HCP for one woman missed the MI diagnosis though she presented

with typical or fast-onset symptom characteristics. One female participant was diagnosed with GERD, while the other participant was diagnosed with strep throat in this study. Similarly, a study on missed MIs in the outpatient setting reported patients with MI symptoms were more likely than controls to be diagnosed with gastrointestinal diagnoses (39% vs. 17%) and upper respiratory infection (28% vs. 6%) (Sequist et al., 2005). Consistent with the findings of this study, Rosenfeld and colleagues (2005) state education of women and their HCPs about the interpretation of MI symptoms remains an enormous barrier in reducing the time of decision-making. The same qualitative study did cite one participant whose HCP diagnosed her with gastrointestinal issues instead of MI, but the HCP was different than those in this study by giving instructions to report to the ED for increased severity (Rosenfeld, Lindauer, & Darney, 2005).

Unlike the missed MI diagnoses in this study, Pattenden and colleagues (2002) found only 68% of physicians correctly attributed MI symptoms to a cardiac origin. In a study among 500 physicians, physicians were significantly more likely to assign women with intermediate Framingham Risk Scores lower scores than men with identical scores (Mosca et al., 2005). Patient recommendations for lifestyle and pharmacological changes are based on the assigned of risk level (Mosca et al., 2005), so there are missed opportunities to prevent negative outcomes among patients with CVD and MI. The two women in this study were not educated on cardiac symptoms to watch for or changes to make in lifestyle, though they both had risk factors for CVD when they presented to their outpatient HCP with MI symptoms.

Two participants (one male and one female) experienced delayed diagnosis upon reaching the ED. One of these patients was not diagnosed for another 14 hours, while the other participant was losing consciousness and near death from the MI before a cardiac origin was recognized. Not unlike this study, studies report 2% to 8% of patients are discharged from the ED while experiencing an MI, frequently with fatal outcomes (Reilly, Evans, Schaider, & Wang, 2002; Sequist et al., 2005). In a study on triaging simulated chest pain among cardiologists, internal medicine, emergency medicine physicians, admission and diagnostic decisions varied broadly as did predictions of patient outcomes (Reilly et al., 2002).

Another HCP barrier which also falls under the category of perceived susceptibility is a recent visit with the HCP. Two of these of these participants had just seen their cardiologist and even recently had a stress test within normal limits. Like Finnegan and colleagues cite (2000), half of this study's participants reported they had recently been to the doctor and were told everything was good or their seemingly non-cardiac related issues were managed. There is a serious lack of literature on this topic, so this finding was quite enlightening and different. As discussed previously, these recent HCP interactions actually lower participant's perceived susceptibility to MI and act as a barrier to immediate action in the event of an MI.

Health care access: Transportation and insurance.

These participants did not know EMS initiated emergency treatment for MI in the field and that EMS is much safer and faster in initiation of emergency care rather than

driving themselves to the hospital. EMS can initiate emergency care in the field and call ahead to a hospital with intervention capabilities to facilitate readiness for thrombolytic use or percutaneous coronary intervention (PCI) to alert staff the patient is coming (Canto, et al., 2002; O'Connor et al., 2010). This gives notice to the cardiologist and colleagues performing the PCI, so there is decreased delay in reperfusion therapies upon arrival at the hospital. Multiple large national surveys have been done reporting the low knowledge of Hispanics regarding the need to activate EMS immediately with MI symptoms (DuBard et al., 2006; Greenlund et al., 2004; Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008; McGruder et al., 2008). Similar to the findings in this sample, Finnegan et al. (2000) reported participants from a large national sample of multiple ethnicities did not know the advantages of using EMS during a suspected MI.

Only two (17%) of the 12 participants used EMS to travel to the hospital, and this decision was made for them by other people. Of these two people, one was sedated from a procedure and the other did not have any access to a car. In a national study of over 322,000 MI victims, 53.4% of patients used EMS without significant variance over a four year period (Canto et al., 2002).

The ten other participants arrived by private vehicle, and eight of these never considered using EMS. Two participants drove themselves to the hospital and eight had someone drive them in a privately owned vehicle. Similarly, the majority of participants in other studies drove themselves or had someone drive them to obtain medical care (Finnegan et al., 2000; Henriksson et al., 2007; Klingler et al., 2002). Unlike this sample,

other studies report anywhere from 22% to 62% of participants used an ambulance while experiencing MI symptoms (Klingler et al., 2002; O'Donnell & Moser, 2012).

There are multiple reasons these participants didn't call EMS: slow-onset symptoms, didn't think it was that serious, someone was there to drive, or they lived close to a hospital. Bottom line: overall these participants were not aware of the potential danger they were in and that they needed EMS to get to the ED safely. Three participants did have a frightening drive to the hospital where their level of consciousness was diminishing en route. Lethal arrhythmias and sudden death are a very real potential danger in the four hours after the onset of MI symptoms (O'Connor et al., 2010).

Eight participants had private health insurance while four had health coverage through the city/county. Two participants did cite the cost of an ambulance being a barrier for many people of Mexican American descent, but this was not a barrier for the people actually citing cost. Like Finnegan's (2000) findings, this study did not find cost of health care or lack of insurance to be a barrier for seeking care during an MI. Unlike this study, some studies have found that cost is a barrier to initiating emergency care in the MI pre-hospital period (Lutfiyya, Bardales et al., 2009; Lutfiyya, Cumba et al., 2008; Warda, 2000). This subcategory is closely linked to inappropriate action/self-efficacy as some people that do not have the means to obtain health care will try to self-treat upon the onset of MI symptoms and engage in other inappropriate actions that delay obtaining medical treatment.

Inappropriate action/self-efficacy.

Every participant attempted self-treatment or self-medication whether it was rest, carbonated beverage, antacid, aspirin, or nitroglycerin. Self-treatment and self-medication have been examined in several studies reporting self-treatment is associated with an increase in pre-hospital delay during MI (O'Donnell & Moser, 2012; Perry, Petrie, Ellis, Horne, Moss-Morris, 2001; Zegrean, Fox-Wasylyshyn, & El-Masri, 2009; Zerwic et al., 2003). Zegrean and colleagues (2010) differentiated self-medicating with prescription and non-prescription medication finding use of non-prescription medication was significantly associated with an increased pre-hospital delay while use of prescription medication was not.

Six participants (including the participant sedated at the dentist) took active action during their MI. This would include the participant that called his cardiology office and got an appointment for three days after his MI symptoms began. Deshmukh and colleagues (2011) differentiated actions into active (called EMS, called physician, took aspirin) and passive (took prescribed medication, took over the counter medication, drank tea, called family and/or friends, tried to relax, waited for symptoms to go away, ignored symptoms, or prayed for symptoms to go away). Similar to this study, Deshmukh and colleagues (2011) found 79% of Hispanics took passive action in response to their MI symptoms. This study and other qualitative work has supported the concept of self-treatment being associated with increased delay time (Finnegan et al., 2000; MacInnes, 2006; Pattenden et al., 2002; Rosenfeld et al., 2005). Johansson and colleagues (2004) did

not find an association between self-treatment and pre-hospital delay in MI. Similar to the descriptions of other researchers (Galdas et al., 2010, Pattenden et al., 2002), participants in this study attempted self-treatment for symptom relief until failure was realized or participants decided their symptoms were severe enough to seek medical treatment.

There was no appreciable difference in pre-hospital delay between men and women in this study or in several other studies (Moser et al., 2005; Perry et al., 2001; Quinn, 2005; Sullivan et al., 2009). One woman reported immediately to the hospital, one had symptoms she and her physician didn't recognize as an MI, and the other two women didn't want to go to the hospital. A fair amount of conflicting literature exists on research of gender in health-seeking behavior during MI. There are researchers that report women delay seeking health care for cardiac symptoms compared to men's behavior (Banks & Dracup, 2006; Nguyen et al., 2010; Patel et al., 2004; Ting et al., 2008) and some researchers cite women putting their domestic family responsibilities before their own health (Finnegan et al., 2000; Galdas et al., 2010). This was not the case with the women in this study. Unlike this study, the literature that reports a difference in the timing of health seeking treatment for MI symptoms suggests there is a gender binary with traditional masculine and feminine behaviors (Galdas et al., 2010).

The findings of this study were in agreement with the work of Galdas et al. (2010) who did not find the stereotypical masculine and feminine behavior consistently. This study had two women that reported specifically not wanting to go to the hospital, trying to avoid hospitalization, and trying to maintain control. Another woman tried self-

treatment of her MI symptoms for two weeks before going to the hospital. Men and women attempted to manage their symptoms with self-treatment through aspirin, nitroglycerine, rest, antacids, carbonated beverages and the like. Men and women interviewed often exhibited both masculine and feminine behavior and gender-role patterns, so that there was not always a clear gender binary similar to the findings of Galdas et al. (2010). As in this study, gender was seen as more of a fluid and complex variable in decision-making and health behavior rather than *the* focal variable (Galdas et al., 2010). Galdas and colleagues describe masculine behavior as "being extremely reluctant to relinquish control of their situation to a health care professional and attempting to manage their condition independently" (2010, p. 20). Galdas et al. describe feminine behavior and the health help-seeking pattern as that centered on self-disclosure and requesting help rapidly, attentiveness to health issues, monitoring the health of the family, nurturing the family, and domestic responsibilities before self-health. This stereotypical feminine behavior did not describe the women of this study, but some of the men in this study exhibited some of these feminine attributes as they sought help for their symptoms.

One behavior during the pre-hospital period that is quite prevalent (Finnegan et al., 2000; Rosenfeld et al., 2005) is the "wait and see" attitude that people often assume once they experience MI symptoms. This was not a behavior exhibited by these participants, but each of these participants was obviously a survivor of their MI with nine obtaining relatively fast medical care.

Clock ticking.

Nine of the participants arrived at the hospital within two to three hours of symptom onset (one participant wasn't sure if time was two or three hours, but the other eight were $\leq$ 2 hours). Of these nine, two experienced short pre-hospital delay but significant in-hospital delay that seriously diminished their treatment options. One participant didn't have his PCI until about 14 hours after his MI. Thrombolytic therapy is recommended for patients that reach medical care within two hours or when PCI would be delayed (O'Connor et al., 2010). The first four hours after the development of MI symptoms have the most potential for sudden death, and this is why rapid initiation of emergency services is crucial (O'Connor et al., 2010). De Luca and colleagues (2004) found the 1-year mortality rate increases by 7.5% for every 30-minute delay in treatment from individuals with ST segment elevation MI. There is an increased risk of death with an increased pre-hospital delay due to fatal arrhythmias and sudden death (AHA, 2005; Rosamond et al., 2008). The majority of participants in this study responded quickly to their symptoms, though most didn't realized the cardiac origin and survived with rapid medical treatment.

Other people around.

In this study, the bystanders around the participant or whom they contacted via telephone prolonged the pre-hospital period and in all but one instance, family did not influence calling EMS. Similarly, participants telling someone about their symptoms was associated with a significant increase in pre-hospital delay in some studies (Løvlien,

Schei, & Hole, 2007; Zegrean et al., 2009). No studies were found on this topic wherein all or the majority of participants were Mexican American. This could be an issue among Mexican Americans as Villarruel (1995) found family members like to seek and give advice when someone is in pain. Some studies yielded inconclusive results on the association of bystanders and pre-hospital delay (Johnasson et al., 2004; McKinley et al., 2000). Research studies vary on the effect of having other people around or contacting others while experiencing an MI.

Of note, the bystanders in this study were all family and spouses among ten participants. Just as the participants didn't recognize the cardiac origin of symptoms, bystanders didn't recognize symptom origin or severity. Consistent with this study, it has been reported family members often increased pre-hospital delay with their recommendations and opinions that symptoms are non-cardiac in origin compared to people unrelated to participants (Arslanian-Engoren, 2007; Moser et al., 2006; Perkins-Porras, Whitehead, Strike, & Steptoe, 2009; Rosenfeld et al., 2005). However, unlike this study, there is literature that reports bystanders facilitating the participant experiencing an MI getting to the hospital with a short pre-hospital period often by initiating EMS assistance (Finnegan et al., 2000; Lesneski, 2010; Lockyer, 2005; MacInnes, 2006; Nymark et al., 2009; O'Donnell & Moser, 2012; Pattenden et al., 2002; Perkins-Porras et al., 2009; Perry et al., 2001). Inconsistent with this sample, Lesneski (2010) reported bystanders obtained medical help for the MI victim (32.4%), called EMS (20%), and encouraged rest or to take medication (9.5%). Pattenden and colleagues (2002) reasoned

someone else calling EMS relieved the MI victim of the guilt of calling EMS and of being a bother.

Bystanders were the ones taking control of the situation during the pre-hospital period of four participants. One participant knew her symptoms were cardiac in origin, but it was her son that expected an MI. She had no intention of calling EMS and did not want to leave her family and go to the hospital where she stated the nurses were mean. Other studies reported similar results as the bystander either supported the participant's decision or let the bystander take control of the decision-making (MacInnes, 2006; Nymark et al., 2009; Rosenfeld et al., 2005). Finnegan and colleagues (2000) found different results as most of their participants had bystanders take control of the pre-hospital period at some point to obtain necessary medical care.

Participants in this study did not use words like "bother" or "burden," but three male participants spoke about not wanting to worry people around them. Participants went about their business as if nothing was wrong or out of the ordinary. This worry thought process in the pre-hospital period is one that is discussed in several studies (Lesneski, 2010; Nymark et al., 2013; Zegrean et al., 2009). Interestingly, Moser and colleagues (2005) found women were concerned about burdening others with their symptoms. There were only four women in this study, so perhaps a larger sample of women would have revealed this worry of burden. One may wonder if there was a cultural component involved in this behavior as perhaps the men were trying to maintain a level of stoicism and work through their pain. Pain is something that may interfere with

respective male and female roles within the family, so the individual must deal with the pain to fulfill their roles and not worry or cause pain for others (Villarruel, 1995).

Category: Perceived Benefits

People may experience pain or even lethal arrhythmias during an MI and immediately after. Upon a call to EMS, paramedics carry a defibrillator and life-saving equipment to the victim. A spouse, family member, or friend driving an MI victim to the ED does not carry a defibrillator and cannot treat a person dying of an MI while they drive. While these sample results were much higher, a recent study reported 39.4% of Hispanics took a private vehicle to the hospital (Deshmukh et al., 2011). There was no apparent reason for the difference in findings, but Deshmukh's study was among Hispanics in general and based in an urban area specifically where people walked and took public transportation.

Most of the participants in this study knew of the lifesaving capabilities of traveling to the hospital via EMS, as did participants in Finnegan and colleague's (2000) study. Deshmukh and colleagues (2011) reported 30% of Hispanic (n = 36) participants believed EMS had the equipment needed for resuscitation and initiated EMS during MI symptoms. However, not a single person in this study made mention of thrombolytics in the event of an MI. Somewhat different from this study, Finnegan and colleagues had a few participants that were aware of thrombolytic benefits. Unlike this sample, another study using an instrument from the REACT trial reported 73.8% (n = 1762) of men and

78.9% (*n* = 890) of women knew that hospitals have medications to help reduce the damage from an MI (Dracup et al., 2008).

Four (33%) participants experienced in-hospital delay in intervention because the closest facility they had drove to was not capable of PCI. EMS personnel are knowledgeable of local hospital capabilities, which facilities are best for a person experiencing MI, and which facilities are capable of PCI and open heart surgery. These are key factors that are often overlooked; however, laypeople do not know which facilities are capable of PCI and this contributes to treatment delay and long-term mortality increase by 7.5% for every 30-minute treatment delay (DeLuca et al., 2004).

Category: Learned Behavior

These participants had survived their MI experience, had an increased perceived threat of an MI, and participants likely had an increase in education on what to do in the event of MI symptoms. Their insight from their lived MI experience may affect their future actions if they experience MI symptoms again or if they are a bystander when someone else experiences MI symptoms. In most instances, it wasn't one statement that facilitated the analysis and determined this subcategory under the category of barriers. It was a number of statements, plus what the participants said once I turned to asking them about their intentions if these symptoms were to happen again or if they had a friend or family member that developed the same symptoms in the participant's presence.

Six (three women) participants said they would call EMS if they experienced suspected MI symptoms again. Studies report 50% to 90% of participants state they

would act rapidly in the event of MI symptoms and call EMS (Greenlund et al., 2001; Meischke et al., 2002; Wyatt & Ratner, 2004). Unlike this sample, Jensen and Moser (2008) found people knew the most important thing to do in the event of MI symptoms in oneself or another person was to call EMS. The other six participants initially stated they would call EMS and quickly expanded on their thoughts to state they would drive themselves or have someone drive them. For these six participants, calling EMS was a last resort. Three of the six thought they lived so close to a hospital that someone could drive them there so quickly.

It's unknown what was different about the patient teaching each participant received. However, five of the six participants that stated they would call EMS were recruited from the same cardiology organization and perhaps had similar outpatient teaching. Three of these actually experienced fast-onset symptoms and acted quickly to get to the hospital via a private vehicle. Two of those six participants had actually experienced suspicious symptoms after their MI hospital admission; one participant did call EMS and the other did not. It was only with the qualitative design of this study with an ongoing interview that I was able to extract the true thoughts and intentions of many of these individuals that may not have been uncovered in a quantitative study. Brown and colleagues (2000) reported quantitative findings from the REACT trial that 89% of participants stated they would call EMS in the event of a witnessed cardiac arrest, but only 23% called EMS while experiencing suspected MI symptoms. Just like this study, participants said they would act, but the majority of individuals delayed seeking care with

only 11% to 20% acting (Finnegan et al., 2000; Greenlund et al., 2001; Meischke et al., 1999).

Two of the women thought the origin of their symptoms was non-cardiac. These two women alluded to waiting until very sure they needed to seek medical care before acting which is a concept prevalent in the literature (Sullivan et al., 2009). Consistent with this sample, Meischke and colleagues (1999) found only 20% of women had the intention to call EMS for their own symptoms of AMI. A more prevalent finding than in this study, Wyatt and Ratner (2004) stated 36% of female participants wanted to be sure they were experiencing MI before going to the hospital and planned to delay seeking treatment.

The same six participants that stated they would have someone drive them to the hospital in the event the participant experienced MI symptoms again also said they would drive a friend or family member to the hospital if that person began experiencing symptoms similar to what the participant experienced. Like this study, Finnegan and colleagues (2000) reported the majority of participants would call EMS only if their symptoms were very severe. These participants would likely have someone drive them to the hospital or drive themselves over calling EMS, which was a last resort (Finnegan et al., 2000). Somewhat similar to this study, Henriksson and colleagues (2009) found 37% of male participants and 33% ($p = .004$) of female participants stated they would drive the symptomatic person to the hospital. The same study participants (MI victims and family members) were more likely (89% vs. 83%, $p < .001$) to call EMS or go to the hospital

(49% vs. 31%, $p < .001$) with a person experiencing MI symptoms than participants would for themselves (Henriksson et al., 2009) unlike this study.

Key Findings

Participants of this study had a preconceived expectation of what an MI was like from cinematic depictions---excruciating and debilitating pain, collapsing on the ground clutching the chest, and very dramatic. The actual symptoms participants experienced in the majority of instances were incongruent with MI expectations. This incongruence contributed to pre-hospital delay in a lack of perceived susceptibility and perceived lack of severity that an MI was occurring. Most participants were not fully aware of all their risk factors for MI and had low perceived susceptibility. Contributing to this low perceived susceptibility and acting as a barrier to the initiation of EMS upon MI symptom onset were recent HCP interactions that told participants their health was fine. Participants had low knowledge of MI symptoms and what to do in the event of MI, so when HCPs told them things were fine, they allowed their perceived susceptibility to decrease. Recognition of MI by women and their HCPs was a serious barrier to initiating medical care in women and contributed to a massive delay in treatment.

Other notable key findings were that sample participants didn't necessarily learn the lessons we, as HCPs. would like them to learn from an MI experience. In the event of another MI experience, these participants didn't plan to do things much differently for themselves, family, or friends. Participants planned to drive themselves to the hospital, have someone drive them, call EMS if alone and cannot drive themself, and the last

choice for half of participants was to call EMS. Participants didn't know the full lifesaving benefits of EMS prior to their MIs and hadn't learned much more about EMS capabilities regarding the initiation of MI treatment after their lived MI experience. Education deficits of the public and HCPs in recognition and treatment of MI needs to be addressed. We as HCPs do not always recognize MI symptoms in individuals experiencing symptoms. Based on these findings, the education of people at moderate to high risk for MI should focus on perceived threat of MI.

Limitations of the Study

There were several limitations in this study. This was a convenience sample of Mexican American patients under the care of local cardiologists, and each participant had experienced their first MI in the last two years. There may have been selection bias due to the fact that all these patients had been compliant with follow-up post-MI with a physician and sought help during their MI period. It was not possible to obtain the stories of people that did not survive their MI.

These interviews were from retrospective accounts self-reported and may be subject to recall bias. The interviewer did not have access to participant records to verify any of their statements, but the intention of this study was to study the participant experience. Looking at optimistic bias in participants post-MI posed some challenges as there may have been some maturation issues as participants had all undergone some degree of patient teaching since their MI and were more knowledgeable about risk factors, MI symptoms, and EMS. Eight participants were recruited from the same

cardiology organization, so much of their teaching was likely similar. Also, each participant knew the interviewer was a nurse, so there may have been some degree of social desirability and response bias. A standard risk calculator such as the Framingham Risk Score to formerly calculate actual participant 10-year cardiovascular risk of an MI may have been used, but this study was post-MI and would not have told us about risk prior to the MI.

The inclusion criteria included participant's first MI, and all final participants screened positive over the telephone. However, during two interviews, participants revealed the MI they were speaking of was not their first. For one of these participants, she unknowingly had an MI months before, so the MI she spoke of in the interview was the first she had been aware of experiencing. The second participant referred to a remote MI she had years before while in her twenties, of which she recalled very little except that she didn't listen to the doctors at the time about her risk factors including hypertension.

Equal number of men and women would have been preferable as there was quite a range of life situations among the women. Three women actually had low socioeconomic status (SES) before their MI and their life situations were even more challenging after the MI. Two of these women were disabled and the other two women in the study worked part-time. There was not a change in the work or financial status for the men and there seemed to be more homogeneity among the men compared to the women.

This was a qualitative study, so we are not able to draw generalizations from it. The data was collected until saturation and no new categories were being found in the analysis concurrent with the interviews. Relevant issues within each category were illuminated for those with an MI to relate participant MI experience in all the richness of qualitative study.

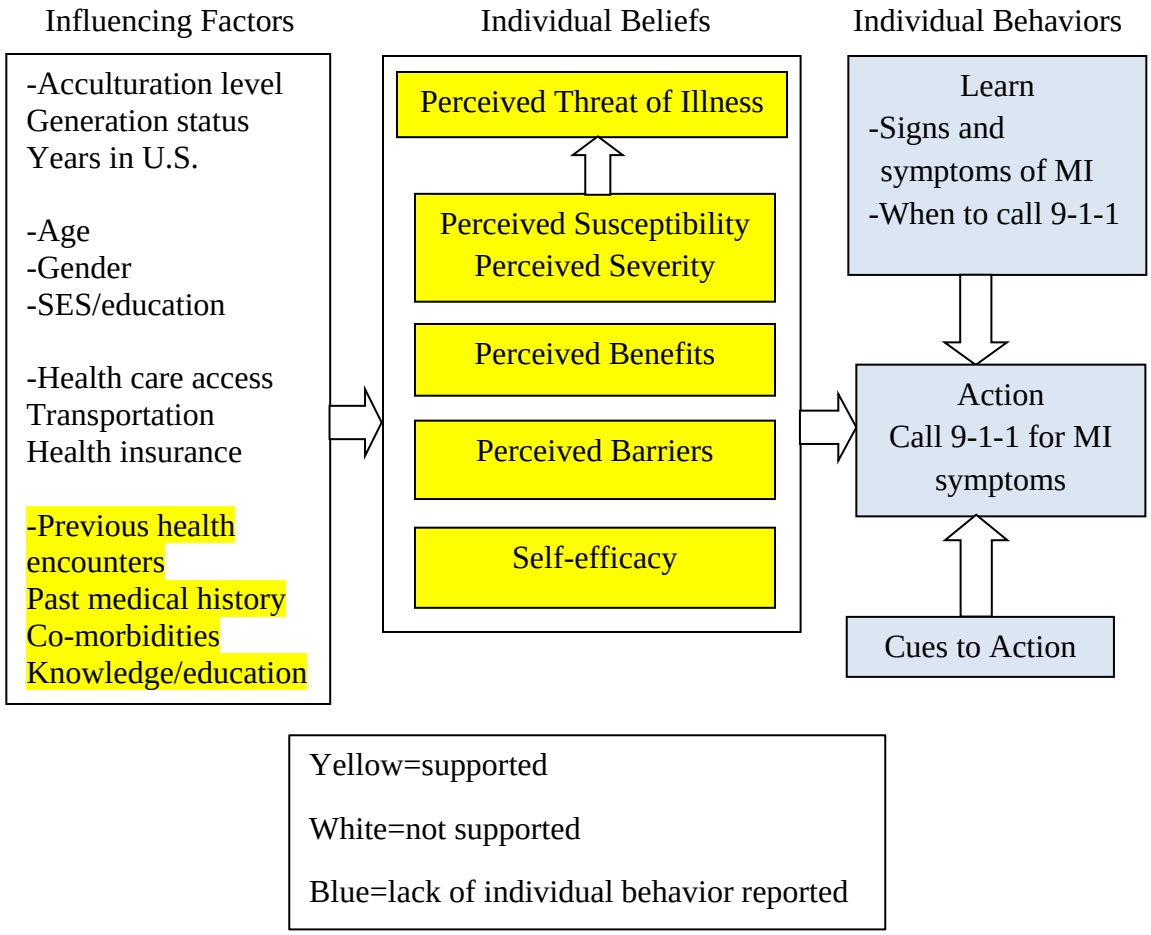
Implications and Recommendations

The following implications and recommendations for theory, research, practice, and health policy are based on the findings of this research study. The perceived susceptibility and severity of a potential MI, perceived benefits and barriers to action, and learned behaviors from Mexican Americans that have experienced an MI have all influenced this section. A common thread running through every aspect of this study was a lack of knowledge on the part of participants, bystanders, and even some HCP.

Nursing Theory

The Health Belief Model (HBM) (Becker et al., 1977; Champion & Skinner, 2008; Janz & Becker, 1984) has been a valuable influence in this study. Based on the general concepts of the HBM, The Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction used to guide this study attempted to describe issues influencing MI recognition and treatment-seeking behavior in Mexican American adults. The perceived benefits and barriers influencing behaviors and the action to seek emergency care in Mexican American adults experiencing MI were examined.

Figure 4. Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction--Revised



Note. MI = myocardial infarction; SES = socioeconomic status.

The study findings support two influences that largely determined the health-seeking behavior for MI symptoms in this sample: 1) the interaction between perceived susceptibility and perceived severity and 2) the difference between perceived benefits and

perceived barriers. The study findings supported the following formulas by Becker, Haefner, et al. (1977, p. 29):

"Susceptibility + severity = threat or 'readiness to take action.'

Benefits – barriers = possibility of threat reduction."

In reviewing the fit between the proposed model and the narrative reports of the participants, some original concepts in the model were supported, while others will require further research to determine their fit in the model. A discussion of the influencing factors, individual beliefs, and the individual behaviors follows.

Influencing factors.

One influencing factor was supported while others will require further research to determine their ultimate fit in this model. The influence of previous health encounters (past medical history, co-morbidities, and knowledge/education) was fairly strong as it related to participants' decisions to use emergency services. The concepts of acculturation, age, gender, SES/education, and health care access (transportation and health insurance) were not shown to influence participants' behaviors. While these concepts were not influential for these participants, further research with a larger or different sample may reveal differences.

Individual beliefs.

Participant narratives overwhelmingly focused on the concepts within the individual beliefs category. Research data fit the Modified Health Belief Model for Use in Mexican American with Myocardial Infarction remarkably well. Perceived benefits

and perceived barriers to the use of emergency services when experiencing an MI were the main focus of this study; however, in addition to these concepts, the participants' revealed that perceived susceptibility and perceived severity combining to form perceived threat of illness were also significant to their experiences. Additionally, self-efficacy was not an initial focus of this study, however, the subcategory of inappropriate action/self-efficacy was revealed as important by participants. Therefore, all of the individual belief concepts in the Modified Health Belief Model for Use in Mexican American with Myocardial Infarction (Figure 4) model were supported (highlighted in yellow) by the findings of this study.

Individual behaviors.

The participants in this study deployed a number of actions (individual behaviors) in response to their experiencing MI symptoms. These actions rarely included calling emergency medical services. The actions taken were more often likely to increase pre-hospital delay rather than decrease it. These actions were often influenced by self-efficacy ('I can drive myself', 'the pain is not THAT bad') and by previous medical encounters (physicians stating the origin of symptoms was gastrointestinal or due to poor nutrition). Self-efficacy was influenced by perceived barriers, severity, and susceptibility for these participants.

Overall the model proposed for this study was supported by participant narratives. The majority of the relationships between concepts were supported; however, evidence of some of the concepts was not revealed in these participant narratives. Specifically the

influence of acculturation, age, gender, SES/education, and health care access were not revealed in these narratives. There were no additional concepts revealed by the participants, however, the influences of self-efficacy and perceived threats were more influential than initially expected. Thus further research is indicated to elucidate these relationships with a qualitative study being the richest starting point to understand these influences on the pre-hospital period during MI. Finally, participant actions were negatively influenced by previous health encounters and high self-efficacy. Both of these factors worked to reduce the likelihood of participants activating emergency services at the onset of MI symptoms (desired action). Further research is needed to determine appropriate interventions to influence positive change in how this population views the advantages in use of emergency services.

Nursing Research

The findings from this research study offer insight for researchers wanting to promote the cardiac health of Mexican Americans. There is a serious lack of research regarding MI among Mexican Americans, and this study is an initial step in filling this knowledge gap. This study was unique in that all participants were of Mexican American descent. Only a few studies have focused on Mexican Americans (e.g., the Corpus Christi Heart Project and the San Antonio Heart Study). Furthermore, when Mexican Americans are included in a study, they are typically labeled as 'Hispanic' which can include many ethnicities (e.g. Cuban, Mexican, Puerto Rican) each with their own distinct experiences that are lost when aggregated together. This study offers a unique view of the experiences

of Mexican Americans living in Texas and will undoubtedly spur further research among this rapidly growing population.

The next steps for this research involve a qualitative study with primarily Spanish-speaking Mexican Americans. This will offer insight into the similarities and differences of pre-hospital actions taken at the onset of MI symptoms for this segment of Mexican Americans. These qualitative findings will offer a sound basis for the development of interventions that are based in the reality of the persons experiencing an MI. Interventions based on what real participants think, feel, and actually do may be more successful than interventions based simply on the theories of HCPs (Rosenfeld et al., 2005).

Another focus area for future research involves determining the most successful ways to deliver public education announcements for Mexican Americans. Images in which people experiencing an MI look like the target Mexican American audience and are relatable are most likely to be successful in increasing perceived susceptibility and severity. We need to assess and evaluate the impact of different images of what MI symptoms look like, who has an MI (gender, age), and the rationale for rapid use of emergency services. Once we have determined which billboard, advertising, and television images result in the greatest impact and determined the most effective delivery method for the information, we will be able to design more effective public messages. It is not enough to teach people what to do, we need to affect the speed at which they do it if we are to decrease morbidity and mortality associated with MI. Next, further research

is needed to explore the deleterious effects that health care provider messages can have on activation of emergency services at the onset of MI symptoms. The participants in this study revealed that they didn't think their symptoms could be an MI because their HCP had said 'there was no damage' or 'prescribed something for GERD.' These statements served as one more reason to delay treatment. Clearly this was an unexpected finding, although after reflection on personal professional experiences it is understandable how a HCP may be attempting to be supportive and yet they may be negatively affecting future health care decisions of their patients. Future work is needed to determine how these interactions influence patient perceived risk and decisions related to use of emergency services. Another unexpected finding was the sense of control a number of participants wanted to retain over their pre-hospital period rather than initiating emergency services or asking bystanders for help. Several participants chose to drive themselves home or to the hospital rather than ask a co-worker or other person for help when their symptoms started. It was unclear, and beyond the scope of this project to delve into this line of inquiry. However, more research is needed to determine the importance of personal control among Mexican Americans having an MI before we can design and implement targeted interventions.

Nursing Practice

The Modified Health Belief Model for Use in Mexican Americans with Myocardial Infarction can be a useful tool for nurses working with people at risk for MI. Each of the concepts depicted in the model is a potential factor that can affect an

individual's actions during an MI. In addition to the concepts depicted in the model (Figure 4), language is another component which should be considered. Language was not a factor in this particular study as all participants spoke English well enough to complete the interview.

Health care professionals need to educate everyone about slow-onset and fast-onset MI symptoms. Using the slow-onset and fast-onset concepts of MI is useful and logical way to educate patients in a way that will be more easily understood than typical and atypical symptoms. This understanding may help them to correctly identify MI symptoms when they occur (O'Donnell & Moser, 2012). Using slow-onset and fast-onset MI characteristics will also help to dispel the common picture people hold of the cinematic heart attack (Hollywood MI).

Next, we need to improve accurate screening of individuals at risk for MI. Electronic screening tools could be pre-populated with lab values and blood pressure (Webster & Heeley, 2010). A review of family history pre-MI can be integrated into the screening tool and may be a strong point to encourage pro-heart behaviors. With all this information the computer could generate a specific treatment plan based on the patient's screening, thus removing the subjective aspect out of the equation (Webster & Heeley, 2010). Patients that minimally screen at moderate to high risk for MI, need to be taught what to do in the event of an MI and why (Finnegan et al., 2000). When asked, half of participants said they knew they should call EMS if they were to experience symptoms; however, they would likely drive themselves or have family drive them to the ED. These

participants had not been taught why they needed to call EMS rapidly, they had just been taught to call.

With the family orientation of Mexican Americans, we need to strive to educate the whole family, not just people at high risk for MI. Influential bystanders can sway people with MI symptoms to recognize the cardiac origin of their symptoms and call EMS rapidly. As health care professionals, we need to educate patients about how discussing MI symptoms with multiple people can lead to further pre-hospital delay (Zegrean et al., 2009). We also need to teach our patients to recognize and minimize their multiple coping strategies as they too can increase pre-hospital delay (Zegrean et al., 2009).

Participant statements relaying HCPs conveying a lack of harm to the heart from an MI call for a careful reflection and examination concerning how and what we communicate to patients. Sometimes we say something and know what we mean and a different meaning is construed by the recipient. Other times, HCPs try to assuage patient fears by saying some positive words. We don't have a practice in place to verify the patient's knowledge and comprehension of a major health event such as an MI, and this lack of assessment may pose as a barrier to seeking immediate medical care in the event of another MI.

The discounting of the female participant statements as she experienced a massive MI in the ED and continued to plead for help and also the participant that called the cardiologist's office complaining of chest pain was obviously disturbing. It goes without

saying that as health care professionals working with the public, we need to work on being respectful, listening skills, and exercise some common sense.

Finally, medication reconciliation is important at each HCP interaction (outpatient appointment or hospital admission) and is necessary before starting a new prescription medication. A good example of this is a phosphodiesterase, such as Cialis (Tadalafil). One participant was prescribed Cialis by his primary physician a month before his MI. During our interview, the participant made the connection between his starting this medication and the start of his intermittent feelings of heartburn for a month before his MI. With increasing use by people across the nation, this is an important topic to address during patient interactions.

Health Policy

Much of our health care spending and focus in the U.S. is on tertiary care. This only addresses people that have already experienced an MI. We need to refocus our efforts with much more primary care in mind. With regular and accurate standardized screening for MI risk factors by all HCPs, we will have the information to provide timely teaching to clients before an MI occurs. Because some individuals do not have a primary care provider, cardiac screening needs to be part of each appointment with an HCP. For example, some women only see their obstetrician annually and are not under the care of another HCP. With CVD being the leading cause of death around the world, it is imperative to complete regular screening, teaching, and follow-up with evaluation for all

patients in all settings. In order for this to occur, health policy will need to be changed to allow for billing of these services in all health care settings.

Conclusion Summary

This chapter discussed the findings of this research study, limitations of the findings, and the implications for theory, research, practice, and health policy. The findings of this study are similar to other studies in that participants had low perceived susceptibility and a lack of symptom congruence with previous MI expectations (Hollywood MI). The participant's degree of perceived threat, taking the benefits and barriers into account, led to initiating emergency medical care. The main contribution of this study was identification of the multiple perceived barriers to activating emergency services at the onset of MI symptoms in light of the degree of perceived benefits. The implication of these findings for nursing practice is the necessity for health care professionals to include regular screening on cardiac risk factors along with interventions and evaluation among patients and family. Further research is needed to identify issues between culture and pre-hospital delay and decision-making. Future research should aim at finding the most successful format to provide public education to Mexican Americans on MI symptom and rapid initiation of EMS.

Appendix A: Letters of Support

November 29, 2011

Jennifer D. M. Sanderson, MSN, RN, CCRN
Doctoral Candidate
25 Meadow Run
Round Rock, TX 78664

Dear Ms. Sanderson;

I am in support of your study *Mexican Americans Seeking Cardiac Emergency Care*. This population of myocardial infarction (MI) victims is often overlooked and denied the benefits of participating in research exclusively focused on Mexican Americans. This study is important because it gives Mexican Americans who have experienced an MI the opportunity to voice their perceptions about initiating emergency care during an MI. There is little research in this area and the potential knowledge gained from the study can lead to increased understanding of the factors that would make someone seek early care and those factors that present barriers to seeking emergency care.

Listening to the voices of the people who you are looking to connect with is an important first step in a successful project. I would be happy to support you in this project in any way possible.

We see a number of patients and their families every week who would meet your study's inclusion criteria. We would be happy to allow you to recruit study participants at our clinic. We are also willing to assist you to identify potential participants for your study from our patients.

Sincerely,

Beth Jackson, MSN, ACNS-BC, CLS
CardioTexas,PLLC

TEXAS HEART & VASCULAR

4316 James Casey Street
Building A
Austin, Texas 78745
www.thandv.com
512 623-5300 P
512 623-5399 F

February 06, 2012

Jennifer D. M. Sanderson, MSN, RN, CCRN
Doctoral Candidate
25 Meadow Run
Round Rock, TX 78664

Dear Ms. Sanderson;

I am in support of your study *Mexican Americans Seeking Cardiac Emergency Care.* This population of myocardial infarction victims is often overlooked and denied the benefits of participating in research exclusively focused on Mexican Americans. This study is important because it gives Mexican Americans who have experienced a myocardial infarction the opportunity to voice their perceptions about initiating emergency care during a myocardial infarction. There is little research in this area and the potential knowledge gained from the study can lead to a better understanding of the factors that would make someone seek early care and those factors that present barriers to seeking emergency care.

We see a number of patients and their families every week who would meet your study's inclusion criteria. We would be happy to allow you to recruit study participants at our clinic. We are also willing to assist you to identify potential participants for your study from our patients.

Sincerely,

John A. Dieck, M.D., F.A.C.P., F.A.C.C.

Nima Amjadi, M.D., F.A.C.C. • John A. Dieck, Jr., M.D., F.A.C.P., F.A.C.C. • Gerald V. Levy, M.D., F.A.C.C. • Vinh D. Nguyen, D.O.
Erol H. Ozdil, M.D., F.A.C.C. • Thomas N. Tracey, M.D., F.A.C.C. • Paul A. Tucker, II, M.D., F.A.C.P., F.A.C.C. • Mo Zeineddin, M.D., F.A.C.P., F.A.C.C.

Appendix B: FAQ Flyer for Providers

Benefits and Barriers to Seeking Cardiac Emergency Care in Mexican Americans

Jennifer Sanderson, MSN, RN, CCRN, Doctoral Student
The University of Texas at Austin, School of Nursing

Frequently Asked Questions

1) What is the purpose of this study?

To describe perceived benefits and barriers to seeking cardiac emergency care including emergency medical services (EMS) activation during an acute myocardial infarction (MI) in Mexican American adults.

2) What is the problem?

Premature death due to cardiovascular disease is higher in Hispanics (23.5%) than non-Hispanic Whites (16.5%) in adults ages 18-65 years. Findings of two large Texas studies indicated Mexican Americans had a higher incidence of in-hospital MI and all-cause cardiovascular mortality than non-Hispanic Whites.

3) What are the inclusion criteria?

Mexican American adults age $\geq$ 35 years who experienced an MI in the last year, express willingness to speak on the topic, and speak English effectively enough to communicate thoughts and provide consent.

4) What are the exclusion criteria?

Mexican Americans with cognitive impairment, institutionalized individuals (hospitalized, imprisoned, etc.), pregnancy, people that have had more than one MI, or anyone awaiting an organ transplant.

5) How many participants are needed?

At least 20 participants are needed.

6) What do I need your help with?

Allow me to place letters in the screened patients' medical records inviting potential participants to participate at the next clinic appointment. Ask staff to let potential participants review the letter of invitation and allow them to respond. If the patient elects to participate in the study, they will be contacted via the contact information patients leave on the letter of invitation.

7) What will participants be asked to do?

Written informed consent (per institutional review board) will be obtained from each participant. Data collection will be scheduled at a convenient time and place for the participants and completed in one meeting lasting 1 to 2 hours. Each participant will be asked demographic information. Oral interviews will be conducted with individual participants and audio recorded. There will be no invasive testing involved whatsoever.

8) Who do I contact if I have any questions?

Doctoral Candidate
Jennifer Sanderson, MSN, RN, CCRN
UT Austin School of Nursing
503-989-0348
sandersoy@hotmail.com

Supervising Professor & Associate Professor
Pat Carter, PhD, RN, CNS
UT Austin School of Nursing
512-232-4709
pcarter@mail.nur.utexas.edu

Appendix C: Recruitment Flyer

Hello,

I am a Registered Nurse and doctoral candidate at The University of Texas at Austin, School of Nursing. I am conducting a study that examines your thoughts about possible things that would make you seek emergency care and things that would prevent you from seeking emergency care during a heart attack. I am interested in hearing about your thoughts about your heart attack symptoms and all the things that happened before you reached a hospital for your heart attack. There are no blood samples or invasive testing done for this study. It will not cost you anything to participate.

This study is short (less than 2 hours), and the study can be done in the comfort and privacy of
your home. I will come to you; there is no need for you to travel. However, you may select another place to meet if it is more convenient for you. I will ask you to tell me about your heart attack and I will audio record the interview. If you would like more information, or you are willing to be a part of this study, please sign below and I will call to and arrange a time we can meet.

Sincerely,

Jennifer D. M. Sanderson, MSN, RN, CCRN, Doctoral Candidate
The University of Texas at Austin
Telephone number: (503) 989-0348

_____I am not interested at this time.

_____I am interested in this study. Please give me a call.

My telephone number is _____

The best time to reach me is _____

Signed _____

Appendix D: Interview Questions

Tell me about your heart attack. What was your heart attack like for you? How did you come to the hospital?

Are there any other things that you feel are important that we have not discussed?

Is there anything else you want to tell me about this?

Is there anything you thought I was going to ask you that I didn't ask?

Probes

Where were you when you started having heart attack symptoms?

What were you doing when you started having heart attack symptoms? What did you do?

What were the heart attack symptoms you experienced?

Were your heart attack symptoms what you expected? Why or why not?

Appendix E: Demographic Data

Participant #:_____

Date:_____

Gender: Male Female

Age (years): _____

Race/Ethnicity: _____

Marital status: _____

How many people live in your home?:_____

At the time of your heart attack, were you employed (full-time or part-time) or retired?:_____

Employment status (full-time or part-time) or retired:_____

Socioeconomic: (check which one applies)

_____I do not have enough money to buy the things I need.

_____I have enough money to buy the things I need, including my medications.

_____I have enough money to buy the things I need, plus a few extras in life.

_____I have plenty of money.

Do you have health insurance?:_____

If you do have insurance, what kind is it?:_____

Education (years):_____

Language spoken at home:_____

Language spoken at work:_____

Generation status in United States (U.S.): Please select one of the following.

_____First generation: I was born in Mexico and immigrated to the U.S.

_____Second generation: One or both of my parents were born in Mexico and immigrated here before I was born.

_____Third generation: One or both of my grandparents were born in Mexico and immigrated here before my parent was born.

_____Fourth generation: One or both of my great-grandparents were born in Mexico and immigrated here before my grandparent was born.

_____Fifth generation: One or both of my great- great-grandparents were born in Mexico and immigrated here before my great-grandparent was born.

How many years have you lived in the U.S.?_____

When did you have a heart attack (month and year)?_____

Has anyone in your family had a heart attack: Y N

Which of your relatives has had a heart attack:_____

Has a doctor every told you that you have other illnesses? If so, what which illnesses have you been told that you have:_____

_____

_____

_____

_____

Tell me about any medications your doctor has told you to take. What is it like for you?_____
_____
_____
_____
What are some of the other places you go for health-related issues?:_____

Appendix F: Unanticipated Problem

OFFICE OF RESEARCH SUPPORT

THE UNIVERSITY OF TEXAS AT AUSTIN

P.O. Box 7426, Austin, Texas 78713 · Mail Code A3200
(512) 471-8871 · FAX (512) 471-8873

FWA # 00002030

Date: 03/14/13

PI: Jennifer D Sanderson

Dept: Nursing

Title: Qualitative Descriptive Study of Mexican Americans Who Seek Cardiac Emergency Care

Re: Unanticipated Problem Report for IRB Protocol Number 2012-01-0122

Dear Jennifer D Sanderson:

An Office of Research Support program coordinator, in consultation with an IRB voting member, reviewed the unanticipated problem report submitted on 03/04/2013. The incident reported did not meet the following checked criteria:

☐ Suggests that the research places subjects or others at a greater risk of harm (including physical, psychological, economic, or social harm) than was previously known or recognized.

☒ Was unexpected (in terms of nature, severity, or frequency) given (a) the research procedures that are described in the protocol-related documents, such as the IRB-approved research protocol and informed consent document; and (b) the characteristics of the subject population being studied.

☐ Related or possibly related to participation in the research (in this guidance document, *possibly related* means there is a reasonable possibility that the incident, experience, or outcome may have been caused by the procedures involved in the research).

The unanticipated problem report is resolved. If you have any questions contact the ORS by phone at (512) 471-8871 or via e-mail at orsc@uts.cc.utexas.edu. Thank you for your assistance and reporting the unanticipated problem to the IRB.

Sincerely,

James P. Wilson

James Wilson, Ph.D.
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I am interested in reprinting the figure of the Health Belief Model printed in the text below. The figure is on page 49 of the text. I am a doctoral student working on my dissertation. I submitted a manuscript to the *Journal of Transcultural Nursing*, and their reviewers now want me to include the original version of the Health Belief Model in addition to my adaptation for my specific population and problem. I do not and will not receive compensation from this journal. I would very much appreciate permission to reprint the figure and credit the source. Please advise.

Thank you for your time,
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